

Author: Pennsylvania Dairymen's Association

Title: Report of annual meeting, v. 1

Place of Publication: Lancaster, Pa.

Copyright Date: 1926

Master Negative Storage Number: MNS# PSt SNPAG024.1

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 008 ENT: 820727 TYP: d DT1: 1926 DT2: 19uu FRE: a LAN: eng
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 246 1 \$i16th has title: \$aAnnual meeting
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 246 1 \$i23rd-<25th?> have title: \$aReport of ... annual meeting
 260 Lancaster, Pa. \$bThe Association \$c1926-
 300 v. \$c23 cm.
 362 0 1st (1926)-
 500 Title from cover
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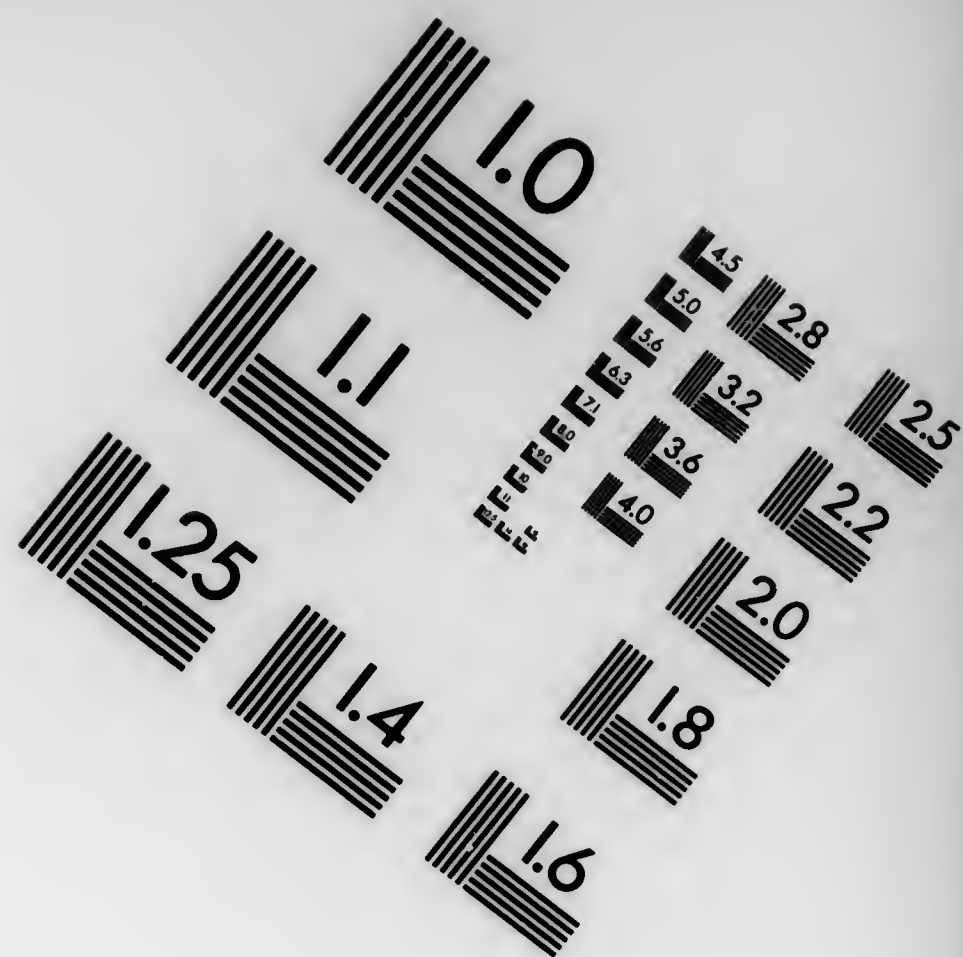
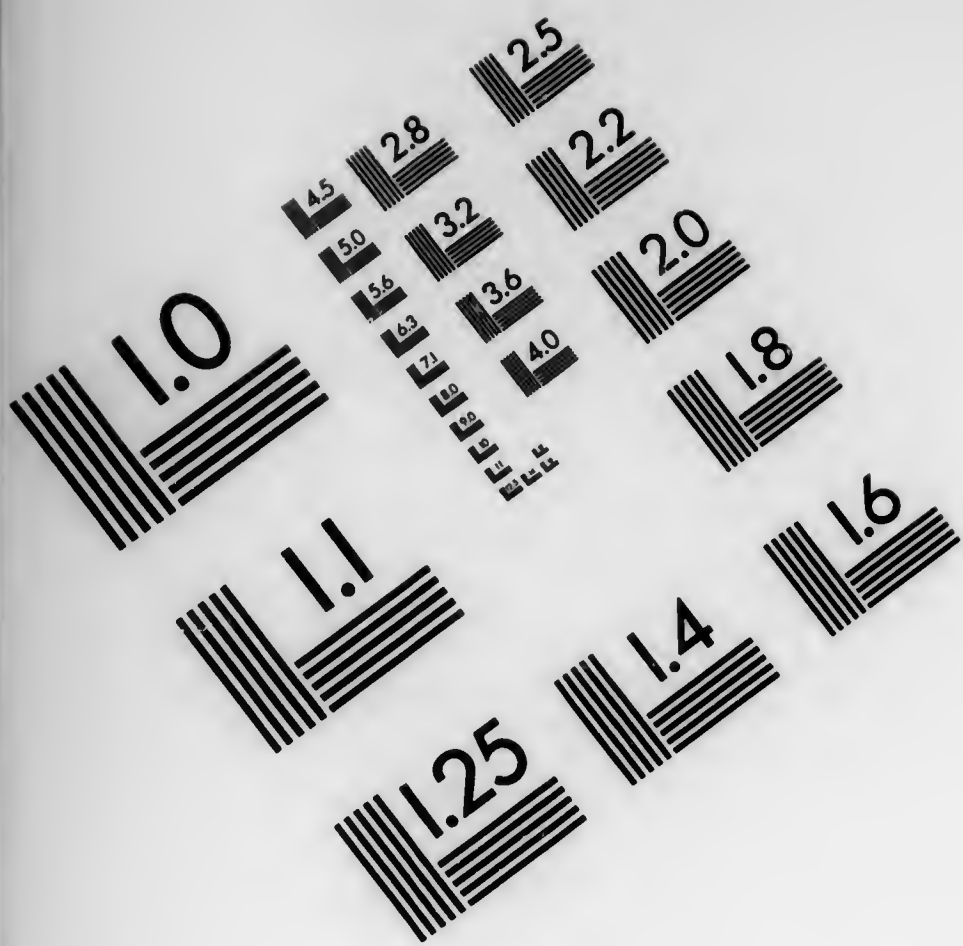
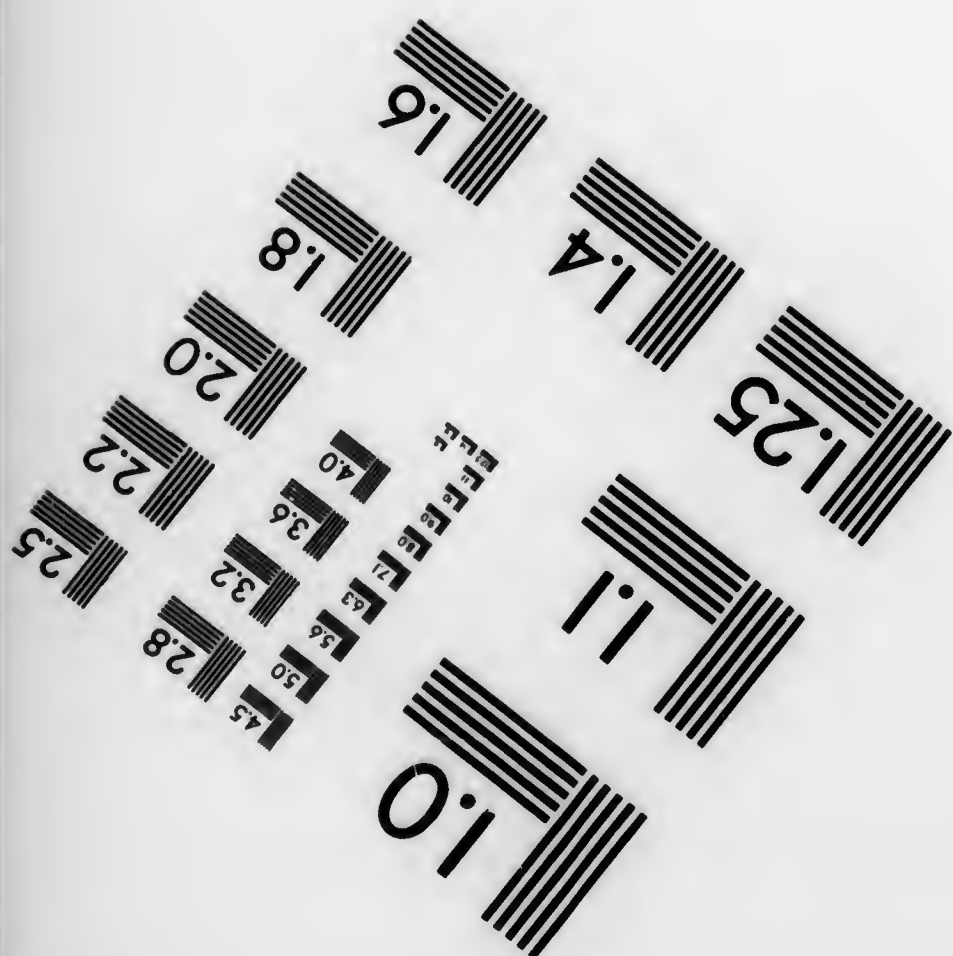
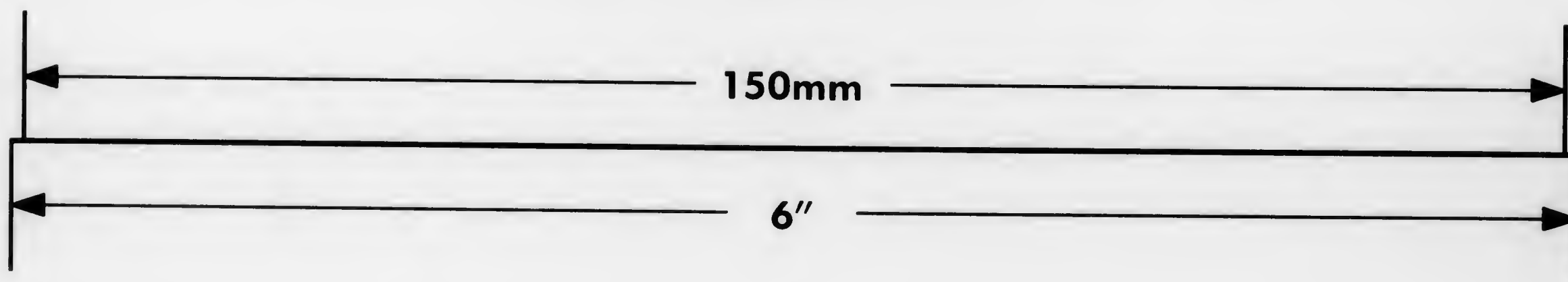
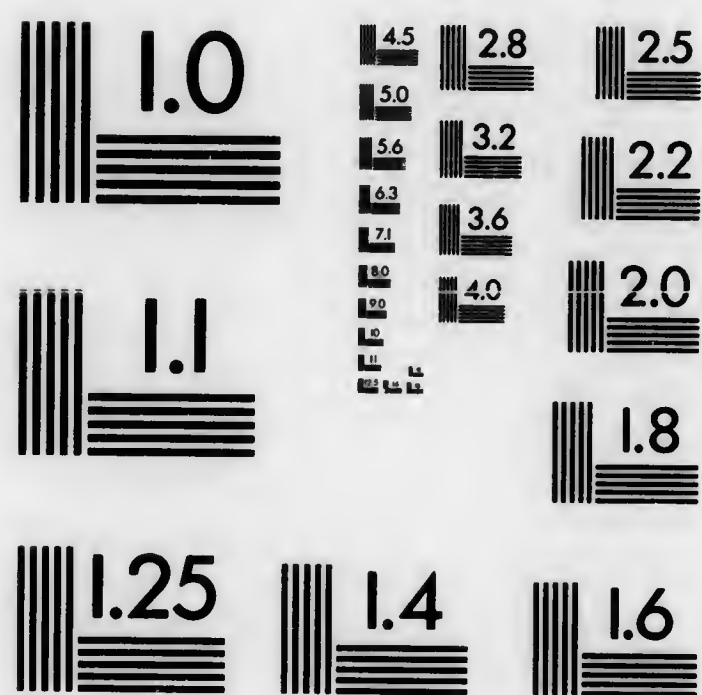
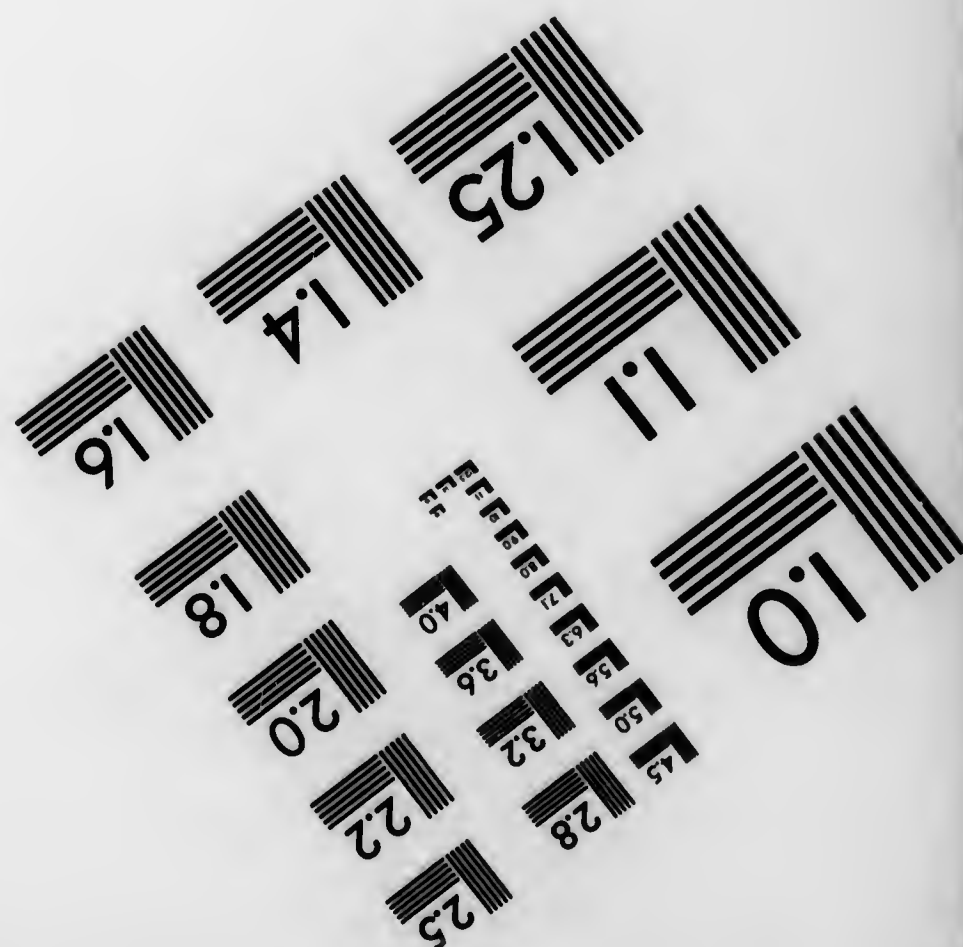


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Volume:

1

THE PENNSYLVANIA DAIRYMEN'S ASSOCIATION

SUCCEEDING THE FOLLOWING ORGANIZATIONS :

The Crawford County Dairy Association (1871).

The Pennsylvania Dairy Association (1874).

The Pennsylvania Dairy Union (1898).

The Pennsylvania Livestock Breeders & Dairymen's Association (1916).

The Pennsylvania Dairymen's Association (Organized 1925).

REPORT OF ANNUAL MEETING

Held in Felton's Hall
HARRISBURG, PENNA.

January 20, 1926

A. A. BORLAND, *President*, State College, Pa.

ROBERT F. BRINTON, *Secretary*, West Chester, Pa.



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THE PENNSYLVANIA DAIRYMEN'S ASSOCIATION

President's Address—A. A. BORLAND, State College, Pa.

In view of the growing importance of the dairy industry in Pennsylvania and the need of an organization in which the producers of milk, the distributors of milk and the manufacturers of dairy products could unite for the common welfare of the industry, it seemed advisable that the dairy interests of the state be united in one organization. Accordingly, at the last annual meeting of the Pennsylvania Livestock Breeders' and Dairymen's Association, which met at Harrisburg in January, 1925, steps were taken to provide for such an organization. The Livestock Breeders continue under the name of the Livestock Breeders' Association, while all persons interested in the production of milk, its distribution and its manufacture into dairy products have grouped themselves under the heading of the Pennsylvania Dairymen's Association. The dairymen, in thus organizing a separate association, have no desire to co-operate less closely than formerly with the breeders of beef cattle, horses, sheep and swine. In fact, it is hoped that even closer co-operation may obtain in the future than in the past. However, there are so many interests in the distribution and manufacture of dairy products which are not closely related to general livestock breeding, that it would appear more desirable to co-ordinate all phases of the dairy industry in a single organization. The Livestock Breeders' and Dairymen's Association has performed notable services in the past and it is hoped that each organization in the future may continue for the development of the industry which it represents. A brief sketch of the history of these organizations may be of interest.

The original Dairy Association was organized in 1871 as The Crawford County Dairy Association. In 1874 its name was changed to the Pennsylvania Dairy Association. However, its officers and members were still largely citizens of Crawford county and its activities were largely confined to fostering the welfare of dairying in that county. On March 30, 1898, the association changed its nature to that of a state wide organization and the name was changed to the Pennsylvania Dairy Union. This meeting was held at Williamsport and officers were elected from various sections of the state. Mr. Harry W. Comfort, of Fallington was elected president and Professor Harry Hayward, of State College, secretary. The purpose of the Dairy Union was

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"to encourage dairy farming in the state, to improve the industry and protect it from fraudulent imitation products which threatened its destruction." A number of prominent dairymen and educators appeared as officers in the early annals of the Dairy Union. Dr. H. P. Armsby, Director of the Institute of Animal Nutrition, at State College and later Director of the Institute of Animal Nutrition, was president for several years. Professor H. E. Van Norman, at that time Head of the Dairy Department of The Pennsylvania State College, later Head of the Dairy Department at the University of California, President of the National Dairy Exposition and the World's Congress, also served a number of years as president and later as secretary. H. M. Stokes, of York, was president in 1911 and 1912. In 1913, E. M. Bailey, of the Rieck-McJunkin Dairy Company, of Pittsburgh, was president and Professor C. W. Larson, of State College, was secretary. Professor Larson later went to Columbia University, then was made Head of the Dairy Division of the Bureau of Animal Industry, and more recently Chief of the Bureau of the Dairying in the United States Department of Agriculture, Washington, D. C. In 1916, the Pennsylvania Union united with the Livestock Breeders' Association in their meeting at Pittsburgh, February 23 and 24. Mr. E. S. Bayard, of Pittsburgh, was elected president of the combined organization and C. W. Gay, secretary.

Going back in the history of the Livestock Breeders' Association with which the Dairy Union united at this time, we find that the Association was organized in 1899 with John I. Gordon, of Mercer, as president and E. S. Bayard, of Pittsburgh, as secretary. Mr. Bayard continued as secretary of the Association until 1913 when he became president and continued in this position until 1916 when the union between the two organizations became effective. Mr. Bayard was annually re-elected president of the combined organizations from 1916 to 1925. Thus, for a period of twenty-five years he served the Livestock Breeders' and Dairymen's Associations either as secretary or as president.

In this position Mr. Bayard rendered valuable services to the livestock breeders and dairymen, as a capable and fearless leader in all matters pertaining to the upbuilding and welfare of the industries he represented. As editor for many years of the National Stockman and Farmer he has been a real friend and counselor to a multitude of the men who feed the livestock and milk the dairy cows of the state.

The Pennsylvania Dairymen's Association takes this occasion to record its appreciation of the notable services rendered

by Mr. Bayard to the dairy industry, as an editor, as a trustee of the Pennsylvania State College and as President of the Pennsylvania Livestock Breeders' and Dairymen's Association. We trust that the Dairymen's Association may continue to have from Mr. Bayard the same counsel and advice which have proven so valuable in the past.

The dairy situation in Pennsylvania today appears to be in a healthy condition, the consumption of dairy products is increasing and prices are on the upward trend. The dairy marketing organizations of the state including the Inter-State Milk Producers' Association at Philadelphia, The Dairymen's Co-operative Sales Company at Pittsburgh and The Dairymen's League in the northern part of the state are rendering real service and deserve the support of all dairymen. The distributing and manufacturing phases of dairying are being consolidated in great combinations of capital which undoubtedly will make for efficiency in these lines. The producers of milk should also be well and completely organized so that all parts of the industry may be well balanced from a marketing standpoint.

The Department of Agriculture at Harrisburg has been active in legislation for the protection of the dairy industry in the state. Act 290, passed at the last session of the legislature, has been particularly helpful in guarding the interests of dairymen by requiring licensed testers to make determinations of the per cent. of butter fat in milk and cream when the purchase of these products is based on the Babcock fat test.

It is encouraging to note the increased interest in the Dairy Course at our Pennsylvania State College. In 1919, six men graduated in the Dairy Course; in 1920, sixteen men; in 1921, twenty-two; in 1922, thirty-five; in 1923, twenty-one; in 1924, thirty-one and in 1925, thirty-seven or thirty-one per cent. of all the graduates in the School of Agriculture. The Department is conducting a considerable number of experiments in dairy production and dairy manufacturing and is endeavoring to fulfill its mission as an educational and research enterprise for the benefit of the dairy interests of the state.

The present dairy building is outgrown, however, and much better service could be rendered were a new and enlarged building available.

The Pennsylvania Dairymen's Association has a large field of usefulness ahead of it in advancing the general welfare of the dairy industry and in promoting improved methods of producing, manufacturing, distributing and marketing milk and milk products. It is hoped that the association will prove of real and

lasting benefit to all persons engaged in any field of activity connected with the dairy industry.

PROGRAM OF THE DAY'S SESSION

WEDNESDAY FORENOON PROGRAM

JOINT MEETING WITH PENNSYLVANIA VETERINARY MEDICAL ASSOCIATION

- 9:00 Present and Future Status of the Tuberculosis Prevention and Eradication Work in Pennsylvania.—Dr. S. E. Bruner, Pennsylvania Bureau of Animal Industry.
- 9:30 Discussion. Led by Hon. E. P. Brown, Montrose, Pa.; Hon. W. A. Haines, Bristol, Pa.; R. H. Engle, County Agent, Erie, Pa.; P. G. Niesley, County Agent, Bloomsburg, Pa.
- 10:00 Pennsylvania Plan for the Prevention and Eradication of Bovine Infectious Abortion.—Dr. M. F. Barnes, Pennsylvania Bureau of Animal Industry.
- 10:30 Discussion. Led by Mr. A. A. Thompson, Uniontown, Pa.; Mr. James B. Robertson, Paoli, Pa.; Hon. W. S. Wise, Meadville, Pa.
- 11:00 Financing the Tuberculosis and Abortion Eradication Work.—J. L. Passmore, Pennsylvania Bureau of Animal Industry.
- 11:15 Discussion. Led by Hon. W. A. Haines, Bristol, Pa.; Hon. Walter K. Sharpe, Chambersburg, Pa.; Mr. R. R. Welch, Grove City, Pa.
- 11:30 How Better Bulls Reduce the Cost of Producing Milk.—S. J. Brownell, Dairy Extension Specialist, Penn. State College.

WEDNESDAY AFTERNOON PROGRAM

- 1:30 Business Meeting.
- 2:30 How Shall I Conduct a Five-Year's Program to Improve My Dairy Herd?—C. G. Gearhart, Dairy Extension Specialist, State College, Pa.
- 2:30 The Factors that Determine the Market Price of Milk.—George W. Slocum, President of the Dairy-men's League Co-operative Association, Milton, Pa. (Copy of this address not available for printing).

- 3:00 A Balanced Pocket Book : Milk vs. Feed—R. H. Olmstead, Dairy Extension Specialist, State College, Pa.
- 3:30 Will the Returns for a Higher Quality of Milk Pay for the Increased Cost of Producing It?—C. I. Cohee, Philadelphia Inter-State Dairy Council, Philadelphia, Pa.
- 4:00 Dairy Barn Improvement—N. S. Grubbs, Agricultural Engineer, Philadelphia.
- 4:30. Better Dairy Profits Demonstrated, Play in charge of P. H. Sprenkle, Ralston Purina Co., St. Louis.

WEDNESDAY EVENING

- 7:00 Dairy Banquet—Masonic Temple.

See page 54 for complete program.

BUSINESS SESSION

At the business meeting the Constitution and By-Laws were adopted, as presented in this report.

**CONSTITUTION OF THE PENNSYLVANIA
DAIRYMEN'S ASSOCIATION**

ADOPTED AT HARRISBURG, JANUARY 20, 1926

Article I. Name

SECTION 1. The name of this organization shall be the Pennsylvania Dairymen's Association.

Article II. Object

SEC. 1. The object of the Association shall be to advance the general welfare of the dairy industry, especially by promoting improved methods of producing, manufacturing, distributing and marketing milk or milk products.

*Article III. Membership***CLASSES**

SECTION 1. Membership shall consist of two classes (a) active, (b) honorary.

QUALIFICATIONS

SEC. 2. The qualifications for membership in the two classes are as follows:—

(a) Any person is eligible to active membership who is interested in the object for which the Association is organized,

(b) Any person who has rendered conspicuous service of a high order of merit to the dairy industry is eligible to election as an honorary member.

ELECTION OF ACTIVE MEMBERS

SEC. 3. Nominations for active membership shall be submitted to the Executive Committee in written form and signed by at least one member. After receiving the endorsement of a majority of the Executive Committee and paying the annual membership dues, the nominee shall be duly enrolled as a member of the Association.

ELECTION OF HONORARY MEMBERS

SEC. 4. Nominations for honorary membership shall be submitted to the Executive Committee in written form and signed by at least five members. After receiving the unanimous endorsement of the Executive Committee and notifying the secretary of

his acceptance the nominee shall be duly enrolled as an honorary member of the Association.

Article IV. Officers

SECTION 1. The officers of this Association shall be a president, a first vice president, a second vice president, a third vice president, and a secretary-treasurer. The term of office shall be for one year. The term of office shall begin March 1st.

EXECUTIVE COMMITTEE

SEC. 2. The president, the first, second, and third vice-presidents and the secretary-treasurer of the Association shall constitute the Executive Committee.

BOARD OF DIRECTORS

SEC. 3. The Executive Committee, the presiding officers of the Sections of the Association, and the president of the State dairy organizations in Pennsylvania, who shall be members of the Association ex-officio, shall constitute the Board of Directors.

DUTIES

SEC. 4. (a) The duties of the officers shall be those usually pertaining to their respective offices.

(b) The Executive Committee shall pass upon all nominations for membership and all applications for the organization of sections of the Association. It shall have the power to fix the time and place for the annual meeting and shall be authorized to transact such business of the Association as demands attention while the Association is not in session.

(c) It shall be the duty of the Board of Directors to give careful thought to problems of importance involving the welfare of the Dairy Industry, to bring to the attention of the Association matters that should have its consideration and to meet on questions of importance at times when it is not feasible to call a general meeting. A majority of the Board of Directors shall constitute a quorum.

HOW ELECTED

SEC. 5. At the Annual Meeting the president shall appoint a Committee on Nominations which shall suggest the names of one or more members for each office to be filled. Additional nominations may be made from the floor. Vote shall be by ballot. The candidates receiving the most votes shall be declared elected.

VACANCIES

SEC. 6. A vacancy in the Executive Committee of the Association shall be filled by appointment by the Board of Directors for the remainder of the term of office.

Article V. Sections

SECTION 1. Groups based upon specialized interests to be known as Sections of the Association and to be formed by not less than ten active members may be authorized by the Executive Committee when considered for the best interests of the Association.

Such Sections may elect their own officers and may make any rules for their own guidance not inconsistent with the interests of the Association as a whole, or with the constitution and by-laws of the Association.

Article VI. Amendments

SECTION 1. The constitution may be amended by a two-thirds vote at any regular meeting of the Association; provided the proposed amendments have been submitted to the Executive Committee in writing not less than thirty days previous to the meeting at which the vote is taken; and provided the proposed amendment is approved by a majority of the Executive Committee.

BY-LAWS**DUES**

SECTION 1. The active membership dues shall be \$1.00 a year, payable March 1st, each year. No dues are required of Honorary Members.

ARREARS

SEC. 2. Arrears for dues for two years shall thereby cancel membership, but the member may be restored to good standing without any action of the Association by payment of all arrears including dues for the current year.

ASSOCIATION MEETINGS

SEC. 3. The time and place of all meetings of the Association shall be fixed by the Executive Committee.

QUORUM

SEC. 4. A quorum at any general meeting of the association for the transaction of business shall consist of not less than ten per cent. of the active members.

SECTION MEETINGS

SEC. 5. The time and place of the general meeting for the Sections of the Association shall be fixed by the Executive Committee. All other arrangements regarding the Section meetings shall be made by the officers of the Section.

STATE DAIRY ORGANIZATION DEFINED

SEC. 6. A State Dairy Organization is one that is state-wide in its nature, such as the Pennsylvania Federation of Holstein-Friesian Clubs, the Pennsylvania Ayrshire Breeders' Association, the Pennsylvania Jersey Cattle Club, the Pennsylvania Ice Cream Makers' Association, the Pennsylvania Cow Testers' Association, the Pennsylvania Association of Dairy and Milk Inspectors, the Inter-State Milk Producers' Association, the Dairymen's Co-operative Sales Company, the Dairymen's League, or others on a similar basis of organization.

AMENDMENT

SEC. 7. These by-laws may be amended at any regularly called meeting by a two-thirds vote of those present.

The Constitution and By-laws, as presented above were un-aminously adopted by the association.

RESOLUTION

A resolution was presented by Mr. John Bennetch, a director of the Inter-State Milk Producers' Association of Philadelphia which was as follows:—

The dairymen of Pennsylvania are in the midst of a marketing improvement program which includes:

Economical production

Tuberculosis eradiction

Higher standards for dairy products

There is a state-wide need of research to assist our dairy farmers in adapting the present farm building to most economically help develop this program.

Therefore be it resolved that the Pennsylvania Dairymen's Association, in annual meeting assembled, urge that the Pennsylvania State College Agricultural Experiment Station assist the dairy industry of the State through research.

Be it further resolved that a copy of the resolutions be sent to R. L. Watts, Dean of the School of Agriculture and Director of the Experiment Station, the Pennsylvania State College.

The following officers were elected for the year beginning March 1, 1926.

President—A. A. Borland, State College, Pa.

First Vice President—Dr. L. M. Thompson, Montrose, Pa.

Second Vice President—M. T. Phillips, Pomeroy, Pa.

Third Vice President—W. F. Shrum, Jeannette, Pa.

Secretary-Treasurer—Robert F. Brinton, West Chester, Pa.

PRESENT STATUS AND FUTURE OF THE TUBERCULOSIS PREVENTION AND ERADICATION WORK IN PENNSYLVANIA

S. E. BRUNER, V.M.D., *Pennsylvania Bureau of Animal Industry, Harrisburg, Pa.*

The Pennsylvania State Livestock Sanitary Board, now the Bureau of Animal Industry, Pennsylvania Department of Agriculture, has been operating thirty years, or since 1896. During these years four outstanding facts concerning bovine tuberculosis have been established.

1. The extent and prevalence of the disease in each county in Pennsylvania.
2. Tuberculosis is of hygienic importance in its relation and transmission to the meat and milk consuming public.
3. Tuberculosis is of economic importance in its relation to the livestock industry.
4. Practical proved methods to establish and maintain tuberculosis-free herds.

PREVALENCE

The extent and prevalence of bovine tuberculosis is based on the results of the initial and subsequent retest of free and infected herds and post-mortem examination of cattle throughout Pennsylvania. It is estimated that of the 1,800,000 cattle in Pennsylvania, 130,000, or 7 per cent., are tuberculous.

HYGIENIC

In man the transmission of bovine tuberculosis through the consumption of infected meat is slight, for the reason that in the majority of cases meat is only consumed which has been previously cooked. Milk is far more dangerous than meat. Medical authorities estimate that 25 per cent. of tuberculosis in man can be charged to the tuberculous cow. Therefore, the repeated ingestion of milk containing the tubercle bacilli is dangerous to human beings, particularly young children.

In a recent area test of 1,808 herds, containing 12,404 cattle, 1,293, or 10.4 per cent., were found tuberculous. In connection with the disposal of three (3) reactors we received a communication from the owner of these three (3) animals, as follows:—

"We had three cows to react in the test and two of these cows we raised our baby on, when the one was dry we used milk

from the other one. Now we would like if possible to have any information you can give us, in regard to where these cows had tuberculosis for the benefit of the child. Any information you can give us will be greatly appreciated."

The post-mortem findings covering each one of the three animals were positive. Unfortunately, the animal whose milk had been used for the child, on post-mortem examination, was found extensively affected with tuberculosis and tanked.

ECONOMIC

From an economic standpoint tuberculosis works financial injury to owners of livestock, as follows:—

1. By destroying animals outright—as when tuberculosis is allowed to reach its full development and kill its victim.
2. By reducing the market value of the animals—as in those cases in which the animal is sold before the disease has reached such a stage as to render it entirely unmarketable. Where tuberculosis has prevailed and cattle owners have become quite familiar with its manifestations, it is the practice to sell suspected animals. In this way a total loss is avoided, but naturally as the animal is in bad condition, only part of its health value can be obtained. Moreover, any saving that the owners may effect in this way is, unless the animal is killed at an inspected slaughtering establishment, at the risk and expense of public health. Every section of the country where the degree of infection is pronounced, 25 to 35 per cent. of such animals, when slaughtered under official supervision, are condemned for food purposes. The packers are well acquainted with these sections and purchase this class of animals accordingly.

The 130,000 tuberculous cattle in Pennsylvania may be divided into two classes as follows:—

15 per cent., or 19,500 animals which upon post-mortem examination are generalized cases and would be tanked for fertilizing purposes. It is conservatively estimated that each animal is being maintained at a \$50.00 annual loss, or a total yearly loss of \$975,000 is being sustained by cattle owners so long as these 19,500 advanced or generalized cases of tuberculosis are retained.

The 110,500 less extensively affected cases are likewise being maintained at a tremendous annual loss to the owners, the sum of which is impossible to estimate. In addition to the failure of many animals in this class to yield an adequate return, many of these non-generalized cases spread the infection to healthy cattle.

Moreover, many cattle in this class, if permitted to live, eventually become generalized cases and enter the first mentioned class.

3. By reducing the breeding value of a herd and its general productivity.

4. By causing a waste of cattle food through feeding it to animals that cannot give adequate return.

5. By infecting other animals, swine and calves through the milk or by contact.

6. By injuring the reputation of a herd, thereby rendering it difficult to dispose of the animals or their products.

7. By destroying the enthusiasm or interest of the breeder in the maintenance of his herd at a high standard.

There can be nothing more discouraging to a breeder of cattle who has devoted a great deal of time or the better part of his life perhaps and much of his money to the development of a particular breed or strain than to see his valuable herd ruined by tuberculosis.

METHODS.

In the distribution of bovine tuberculosis the degree of infection is more prevalent close to the larger centers of population. This is due to the fact that the cattle owners are, in the majority of cases, only dairymen. The methods usually followed by these dairymen are to replace members of the herd when they are unprofitable, insofar as milk production is concerned, by fresh cows. This means constant changes in this class of herds with little or no consideration given to healthy cattle, thus sooner or later such herds and premises become infected.

In order to comply with the municipal milk ordinances, many such herds have been tuberculin tested under no particular plan especially not under Federal-State supervision, the reactors slaughtered, and little or no consideration given to cleaning and disinfecting of the infected premises, no effort made to correct faulty sanitation, herd additions originating from unsafe herds, no definite plan for retesting, little consideration given to the prevention of the disease, many of such owners are not in full sympathy with the establishment and maintenance of tuberculosis-free herds. As the result of subsequent retesting of these herds it is not unusual for the tuberculin test to detect as many tuberculous animals as on the initial test of the herd. The results of testing this class of herds have led many owners and others to the conclusion that it is only possible to establish and maintain an occasional herd on a tuberculosis-free basis.

It must be remembered that the tuberculin test alone will not eradicate tuberculosis—it is only one of the several phases of the work. It is admitted by those who have studied the subject that tuberculosis can not be eradicated from herds without the co-operation of owners and the earnest desire on their part that the disease should be suppressed. In addition to the owner's support, it is necessary to have the public interest and confidence in the work.

Plans available for the owners should be practical from the owner's standpoint, keeping in mind that the methods applied will place his herd on a tuberculosis-free basis in the shortest possible time. The officials who direct the work and those in the field should be properly trained and equipped to render efficient service. Quality in the work, rather than volume, should always be kept in mind. Reacting animals detected as the result of tuberculin test must be promptly removed from the herd. Stables, yards, etc., must be promptly and thoroughly cleaned, followed by disinfection. In this respect one thought must be kept in mind—that disinfectants cannot destroy germs with which they do not come in contact. The disinfecting of infected premises should be done in all cases under official supervision. Faulty sanitation should be corrected—cleanliness, fresh air and sunlight are essential to health. Herd additions should be from herds under official supervision that have passed at least one tuberculin test.

In Pennsylvania we have always been of the opinion that tuberculin testing should be voluntary rather than compulsory, and we have no law requiring owners to submit their herds to test and this voluntary method has been followed in Pennsylvania since 1896.

In conducting area testing a township is considered a unit. This unit is qualified for test by having at least 90% of the herd owners voluntarily sign an agreement placing their entire herd to be tested under official supervision, according to the provisions of the Modified Accredited Area Plan. The County, or other co-operating agencies, are required to provide funds for tags, disinfecting material, disinfector's salary and expense, and transportation. Townships are tested in the order in which they qualify, at such times when personnel and funds for indemnity are available.

RESULTS

On January 1, 1926, 63,446 herds, containing 492,051 cattle, or 32% of Pennsylvania's cattle population were operating either under the Individual or Area Plans.

The cattle in 347 townships in 31 counties have been tested on an area basis. In 6 of the 31 counties the cattle have all been tested and the degree of infection has been reduced to less than $\frac{1}{2}$ of 1%, which means that Mercer, Crawford and Jefferson Counties are Official Modified Accredited Counties. The cattle in 3 other counties have been tested, namely—Lawrence, McKean and Butler.

The following chart covers the work of T. B. testing during the calendar year, 1925.

CHART No. 1

	<i>Herds</i>	<i>Cattle</i>	<i>Reactors</i>
Ind. Acc. Plan	7,994	121,246	7,645
Area Plan	36,658	236,696	15,677
Unofficial Plan	3,207	26,104	838
Total	47,859	384,046	24,160

It will be noted from the above chart that the tuberculin testing covers the work conducted during 1925 under the three plans available for owners to T. B. test their cattle.

In comparing the number of cattle tested during 1925 with 1924, there is an increase of 137,780 cattle tested over the preceding year. A further comparison of the records will show that a greater number were tested during 1925 than during the first 26 years of the existence of the Bureau of Animal Industry. In connection with the number of tuberculous animals disposed of during 1925, it will be noted from the chart that there are 24,160 tuberculous animals disposed of, and this is approximately four times the number disposed of in any one preceding year.

INDEMNITY

Of the \$2,099,000 that was available June 1, 1925, for the fiscal period ending May 31, 1927, claims to the amount of \$499,429.20 have been paid to owners since June 1st, leaving a balance of \$1,600,570.81.

For the Federal fiscal year beginning July 1, 1925, \$200,000 was allocated to Pennsylvania for the payment of Federal indemnity. Of this amount \$89,529.97 has been expended, leaving a balance of \$110,470.03.

EFFICIENCY OF AREA TESTING

The question has been asked a number of times "Does the efficiency of the work conducted under the Area Plan compare favorably with the results obtained in the testing of herds under the Individual Accredited Herd Plan."

In summarizing the work under the Individual Plan during various periods in the past it was found that in the second test of infected herds approximately 4% were found tuberculous. These tuberculous animals failed to react to the initial test but became infected between the first and second test.

In Crawford County on the initial test of approximately 350 herds, 5% reacted. In the testing of all the cattle in the County on an area basis, the percentage was 2.8%. By concentrating our efforts on infected herds and then applying a retest to all the cattle in the county a year later from the date of the first county-wide test, the percentage of infection found was .8%. The degree of infection was reduced in a like manner in Mercer County, and the testing of cattle in a number of townships in other counties.

It will be noted by the following chart that in the initial area testing of the cattle in 204 townships containing 28,627 herds, 2,474 herds were found infected and that there was 27,412 cattle in these infected herds and as a result of the initial test, 6,448, or 23%, of the cattle reacted. In a 90-day retest of these infected herds, exclusive of the animals that reacted to the initial test, 731 or 3% reacted to the retest. Under the Individual Accredited Herd Plan and in the retesting of the cattle in the townships tested on an area basis in which a sufficient time has elapsed to apply a 9-month or yearly retest, our records show that we are dealing with less than 1% of the disease after the second tuberculin test has been completed.

CHART No. 2

	<i>No. Twps.</i>	<i>No. Herds</i>	<i>No. Inf. Herds</i>	<i>No. Cattle Inf. Herds</i>	<i>No. Reac.</i>	<i>%</i>
In. Tests	204	28,627	2,474	27,412	6,448	23
First Retest ...	202				731	3

HERD IMPROVEMENT

It is now recognized that most every phase of livestock improvement must be based on healthy animals. This fact is being appreciated by an increased number of owners each year. It is possibly best demonstrated by the results obtained in the testing under the Individual Accredited Herd Plan in nineteen counties covered by the following chart:—

CHART No. 3

		P. B.	Gr.	Total
	Herds	Cattle	Cattle	Cattle
In. T. B. Test ...	2424	13,675	25,838	39,513
No. Reacted		1,854	3,291	5,145
Last Test	2424	16,813	22,405	39,218
		4,970 or	142 or .5% loss	
		36% gain		

This chart shows that on the initial test under the Individual Accredited Herd Plan of 2,424 herds, containing 39,513 cattle, of which 1,854 P. B. and 3,291 grades, or a total of 5,145 cattle were found tuberculous. On the last test of these 2,424 herds it will be noted that a total number of cattle tested numbered 39,218, which is a loss of 295 cattle from the original number of these 2,424 herds, but by comparing the table further it will be noted that of the original number of P. B. cattle tested, 1,854 were removed as tuberculous and there are now in the same herds a total of 16,813 cattle, of which 4,970 reacted. This shows a 36% increase in the number of P. B. cattle and a loss of 142, or .5% in the grades.

During 1925 there were 16,882 cattle brought into Pennsylvania for dairy and breeding purposes. If the activity in connection with livestock improvement work continues that is taking place, following the tuberculin test, we are of the opinion that within the next ten (10) years we will breed and raise a sufficient number of dairy and breeding cattle in Pennsylvania to meet our needs. There are approximately 260,000 cattle waiting test under the Individual and Area Plans. There are 230 townships in 34 counties that have qualified for test on an area basis.

The present amount of funds available for maintenance and indemnity, and anticipating similar action by future Legislatures, with the present interest on the part of herd owners and other agencies directly interested in this work, we can reasonably assume that the disease will be reduced to less than 1/2 of 1% in Pennsylvania during 1933.

Dr. L. A. Klein, an authority on milk hygiene, in an address before the Eastern States Tuberculosis Conference, held at Providence, R. I., June, 1925, made the following statement:—

"Tuberculosis in its relation to the milk supply, the accredited herd movement, the area testing, has an important public health aspect even though it is possible to destroy the tubercle bacilli in milk by proper pasteurization. First of all, it will be generally admitted that it is better practice to make use of a

time-tried and reliable method of keeping tubercle bacilli out of milk than to depend on destroying them after they have gotten in. Pasteurization will still be necessary if milk is free of tubercle bacilli unless suitable precautions can be taken against the possibility of infection with typhoid and other human pathogens, which may be transmitted by milk, but the process would be simplified. The other organisms require less heat to kill than the tubercle bacilli, and if these latter organisms were absent it would not be necessary to heat the milk to as high a temperature. This would lead to economics in the pasteurization and cooling of the milk. Furthermore, a temperature could be used which would allow a greater margin of safety to insure the destruction of any pathogenic organisms present without interfering with the separation of the cream or affecting the taste of the milk. These are all advantages of considerable importance."

It would, therefore, appear that regardless of whether or not milk is pasteurized it will be necessary to continue the prevention and eradication of bovine tuberculosis through the medium of the tuberculin test and sanitation.

DISCUSSION ON PRESENT AND FUTURE STATUS OF THE TUBERCULIN PREVENTION AND ERADICATION WORK IN PENNSYLVANIA

Led by HON. E. P. BROWN, Montrose, Pa.

We have heard from Dr. Bruner about the work of the Bureau of Animal Industry in the past and particularly of the work of Tuberculosis Eradication during the past year.

I want to say a few words to you from the standpoint of a dairyman handling a large herd for a number of years, and as a new Member of the Legislative Body here at Harrisburg.

I come from Susquehanna County in the northern part of Pennsylvania and dairying is our chief industry. About a year and a half ago we started a campaign to get our farmers to sign up for the test, and at the present time we have tested nineteen townships with an average of 13.7% reactors. Have retested sixteen townships with an average of about 2% reactors on retest. We have eight townships to test and they are all signed up but one.

Too much credit cannot be given our County Agent, Mr. Miller, who has made this subject his major project for the past year and has successfully taught our dairymen the necessity of doing this work at once.

We produce a great many fine cattle to be sold outside our County each year and we hope to be in a position to have healthy cows to offer you for other parts of Pennsylvania by the time you need them.

Judging by the experience we have had in our County it is impossible to have everyone happy, but I have been very pleased with the general reaction to the work. Most of our farmers are glad to find just how they do stand and—just like having some teeth pulled—when it is over they are glad they are out.

In general, the salvage from the condemned cattle has been satisfactory.

The work of cleaning and disinfection of the premises has been a heavy burden upon the County, but in my estimation is one of the most important things in connection with the work and it has been and should be very carefully done.

I am convinced that there is a great need now for an Educational Campaign to be carried on by some agency and I personally think it should be taken up by our County agents.

Our dairymen should be taught how to carry on and to keep their herds clean.

They should be shown how to build up better herds now that they are rebuilding.

They should be shown that it is absolutely essential that they use pure bred sires and that these sires come from families producing something better than skim milk, as this will eventually be a big problem, the public constantly demanding a better cream line on the bottle of milk delivered to the door.

From a legislative standpoint it has been a very happy experience to be able to work and to help in this very important campaign to eradicate tuberculosis in cattle in Pennsylvania.

It was my privilege as a Member of the Agriculture Committee to have been asked to work on the Sub Committee that had these bills and this work in charge in the House, and after the storm had all blown over I think you will agree that the final results were quite satisfactory.

Too much credit cannot be given to our Chairman, Dr. Haines, the other members of the Sub Committee, Mr. Stark and Mr. Deim. Also to our friends in the Senate who co-operated in every way.

Every possible help was given from the Bureau of Animal Industry.

I also wish to thank those who came to Harrisburg to appear before hearings. It all helped.

This battle to eradicate bovine tuberculosis will not be over this year and we must always be looking ahead, so I want to urge upon you all the importance of maintaining a friendly attitude on the part of our members.

Don't forget that our friends from the large cities went along with us to help pay this big rural bill and it would be a fine thing for each and everyone of you to thank any and every friend whom he may know from the cities who went along for us.

And don't forget that another election will be coming around and we are going to need the support of all of our friends again.

See to it that the men from your home districts are heartily in favor of this work so that the program which has been started will have Pennsylvania as clean as our present knowledge of the disease and its eradication can make it.

DISCUSSION ON WORK IN PENNSYLVANIA

Continued by P. G. NIESLEY, *County Agent*, Bloomsburg, Penna.

The subject assigned for discussion has been so thoroughly covered in the paper charts and maps presented by Dr. Bruner that there is some question as to what might be added of value at this time. The wonderful work that has been started and is continuing so well is to my mind one of the greatest of co-operative plans, when we consider that the matter of testing all of the cattle in a county without the financial help of the Federal and State government, would be entirely impossible at this time since the cattle owners in no single township would undertake this mammoth task alone. In addition to this financial help, we have of course the benefit of the experience of the State and Federal Bureaus in handling the matter. I think it was fortunate that the basis for qualifying for the test, under the area plan, required that 90% or more of the owners indicate their desire to place their herds under the supervision. We discovered in Columbia County, when thoroughly understood, nearly all owners wanted to have the test applied.

Now that the test has come to all but two of the townships in our county, we find every expression of interest and enthusiasm in the work, and the men are looking forward to their retest and to the time when their township in the county can be considered a modified accredited area. Fortunately the percentage of reactors in some of the sections included in Columbia County runs fairly low but the whole matter is justified and kept sold to the owners on account of the fact that in nearly every township tested a few bad herds were found.

In several instances the entire herd was taken and the other thing of interest with us is the fact that few of the so-called native cattle react to the test. This serves as an assurance to the owners here that it is possible to keep herds clean when they are once known to be free from the disease.

All sections of the state are interested in doing the things that will provide for more economic herds of dairy cattle. The initial step in the direction of accomplishing this end has been taken when the tuberculosis test has been applied. It is not economically safe for any cattle owner to proceed with the things that will make for a higher producing herd until he is assured that tuberculosis is not present in the herd and when once assured of this we find owners are already expressing a greater interest in the use of better sires, or culling, their herd, or the introduction

of high grade or pure bred cattle as a foundation for a future herd of a high standard.

I have no question about the continued success and support of the work in the area testing. I believe, however, that a great deal of work must be done through the agencies existing in the counties to educate many of the dairy cattle owners on the importance of individual care in keeping their herds clean and safe for the future.

As it became necessary to handle the work on a county-wide plan, needless to say there are many owners who simply came along but do not today fully appreciate the obligations involved as well as precautions necessary to continue on a plan which will be 100% safe so far as keeping their herds clean is concerned.

I believe with the interest and county pride that has developed as a result of this work we can count on individual owners serving as policemen and thereby count on their support in keeping the area free from the disease.

I want to commend the Bureau on its comprehensive program, planning for a state-wide clean up in 1933 and pledge the utmost support it will be possible for us to give to the work within our jurisdiction.

THE PENNSYLVANIA PLAN FOR THE PREVENTION, REPRESSION AND ERADICATION OF BOVINE INFECTIOUS ABORTION

By M. F. BARNES, *Pennsylvania Bureau of Animal Industry,*
Harrisburg, Pennsylvania

Bovine infectious abortion is a specific transmissible disease of cattle to which all classes of bovine animals are susceptible. Occasionally calves are born infected and remain infected to maturity. Most calves, however, cease to react before six months of age. Non-pregnant animals including virgin heifers and bulls become infected.

This disease is caused by a germ called *Bacillus Abortus Bang* which was discovered in 1896 by Professor Bang, of Denmark. Since the discovery of the cause, the disease has been studied rather extensively with the aim of finding ways of combatting it; although until within recent years no definite effective measures have been recommended for its prevention.

Bovine infectious abortion is now prevalent in most every country in which the cattle breeding and dairy industries are developed. It is the most important disease now prevalent in this country with which dairymen have to deal from a herd efficiency standpoint. It is usually first made manifest by the occurrence of an abortion, which is only one of its symptoms. The disease is transmitted from one animal to another and is introduced into herds through the addition of diseased animals. After its introduction in this way as high as 100% of all mature female animals in the herd have been known to abort in a single year. In one herd 92% of all mature females aborted the first year after a diseased cow had been introduced; 62% aborted, or were sterile, the following year, and after that breeding troubles and inefficiency continued in the herd.

If this disease gains a foothold in a herd, whether a high percentage of the cattle abort the first year or whether the disease pursues a slower course, 75% to 80% of the mature females in the herd will eventually have aborted; several will have aborted more than once and a number will have become sterile. Cows which abort or are sterile over a period of one year will not produce on an average more than half the amount of milk produced when calves are carried to maturity. Herds extensively

infected with abortion disease usually fall below 60% efficient from a breeding standpoint and seldom go above 75% efficient either from breeding or milk production standpoint.

An example of this is shown below:—

A LIABILITY		A VALUABLE ASSET	
25 cows in abortion		25 cows in abortion	
infected herd in one		free herd in one	
year produced		year produced	
65,000 lbs. of milk @		125,000 lbs. of milk	
5c per lb.	\$3,250.00	@ 5c per lb.	\$6,250.00
9 calves @ \$50...	450.00	24 calves @ \$50..	1,200.00
Total	\$3,700.00	Total	\$7,450.00
Maintenance @ \$150		Maintenance @ \$150	
per cow (feed, care		per cow (feed, care	
and overhead) ...	3,750.00	and overhead)	3,750.00
Net loss	\$50.00	Net gain	\$3,700.00

In order for a herd to be highly efficient, it must be in a good state of health. Health is the most important essential to productive dairying. Health of the herd is the most important essential to the production of wholesome milk. Healthy herds usually range between 90% and 100% efficient from both breeding and milk production standpoints. Prevention of disease thus becomes necessary to high efficiency in dairy herds. No herd is properly managed which does not include in its system of herd management, a system of disease prevention. Every dairyman should aim to place his herd on a highly efficient basis through the prevention of disease, and thus make his business more lucrative. Prevention of disease is the "Key" to a successful dairy business.

The calf may be looked upon as the "nucleus" of the cattle breeding and dairy industries. The production of milk is a normal physiological function of a dairy cow and in order for her to perform this function to normal capacity she must perform her other normal physiological function by giving birth to a normal calf about once each twelve or fourteen months which due to the close relationship between the reproductive organs and the milk forming gland—the udder, at each pregnancy and normal calf birth, brings about the renewed stimulation necessary for maximum normal milk production.

Dairymen cannot afford to maintain herds infected with this disease for which no cure and no successful method of vaccination is known, yet there are still a few breeders who are willing to

increase the maintenance expense of their herds through the purchase of useless and possibly harmful concoctions, which are purchased at comparatively high cost with the hope that these concoctions will rid their herds of the disease. This disease, however, can be prevented and can be eradicated through repeated blood testing, elimination of reactors and the practice of preventative measures. To successfully carry out such a system requires considerable patience and perseverance but is well worth while. For one to become convinced he need only compare the efficiency of free and infected herds.

The Pennsylvania plan for the prevention, repression and eradication of bovine infectious abortion is a plan based on sanitary principles, blood testing and elimination of reactors and has been a successful method of eradicating this disease from a number of herds.

During the last thirty years the Pennsylvania Bureau of Animal Industry has constantly studied this disease with the hope that suitable methods of prevention and control would be devised. Several treatments were given a thorough trial, the carbolic acid, metholine blue and Albrechtsen uterine douch treatments were tried and the results of a number of other treatments were observed. None of these accomplished the desired end. During the years 1910 to 1915 blood testing was done on a rather extensive scale in Pennsylvania herds but other than being a method of diagnosis of the presence of the disease in a herd, little importance was attached to the results for the reason that the test did not determine which animals would abort.

During the time of this eliminative study we continued to go around in a circle, that is, always ended at the starting point.

We could give no definite advice to breeders until in 1919 Dr. T. E. Munce, Director of the Bureau of Animal Industry, Pennsylvania Department of Agriculture, conceived the idea, or became of the opinion that a health standard should be established, reference to breeding diseases of cattle and during the following year he drafted a standard concerning which he sought the advice of a number of breeders and veterinarians. Most every person consulted on this question agreed that it was a step in the right direction but most of them expressed the belief that the requirements were so stringent that no herds could comply therewith; and as a consequence, the Pennsylvania plan did not materialize until 1921. At this time the breeding diseases had been thoroughly studied in one herd over sufficient period to form a basis for the plan; this was Ardrossen herd owned by Col. Robt. L. Montgomery, Ithaca, Pa. Mr. Montgomery adopted the

motto, "An animal which once leaves this farm must never set foot back on it." This was favorable to the work being done by the Bureau in that it eliminated the possibility of diseased animals being added to the herd. This herd is now due for the fifth renewal of abortion-free certificate number one. The herd during the last five years has averaged slightly more than a calf per year and during this time there has been less than 2% sterility.

The Pennsylvania Plan for the Prevention, Repression and Eradication of Bovine Infectious Abortion.

Made December 1, 1921—Revised December 1, 1924 and December 1, 1925

1. The Pennsylvania Plan for the prevention, repression and eradication of bovine infectious abortion is a plan based on sanitary principles and includes repeated blood testing of the herd and elimination of reactors.
2. An abortion free approved herd under the Pennsylvania Plan is one in which no evidence of bovine infectious abortion has been shown and in which no reactors to the abortion blood test have been found over a period of at least one year.
3. To benefit by the Plan, the owner must place his herd under supervision of the Bureau of Animal Industry, Pennsylvania Department of Agriculture for the prevention, repression and eradication of bovine infectious abortion.
4. No herd will be placed under supervision, the owner of which is not practicing measures against tuberculosis.
5. The work of the Bureau of Animal Industry will be conducted co-operatively with the owner and his veterinarian.
6. The history is obtained and blood is collected from the entire herd by the owner's veterinarian under the supervision of the Bureau of Animal Industry and tested by said Bureau.
7. A list of cattle tested shall be supplied the Bureau at each time a test is applied so that the blood sample can be identified by the name and registry number of the cow, tattoo or ear tag number.
8. A herd in which there are reactors to the first test, all reacting animals shall be either disposed of in a manner satisfactory to the Bureau of Animal Industry or placed on a separate premise and will be known as the "Infected Herd." Premises must be thoroughly cleaned and disinfected. The animals which pass the test, if separated from the reactors, shall be known as the "Clean Herd".

9. A herd in which reactors are found as described in Section 8, a retest must be applied to the clean herd in 30 to 60 days subsequent to the date of first test, and additional reactors must immediately be disposed of as provided in Section 8.

10. The clean herd shall be tested at such intervals as deemed advisable by the Bureau, but in no case shall there be a period of more than one year between tests. If additional reactors are found they shall be handled as provided in Section 8. Animals from the infected herd which do not show a reaction may be placed in isolation and retested in 60 days, and if they pass the retest, may be placed in herd if Section 15 is complied with. Individual animals shall be subjected to such test or tests and at such intervals as the Bureau of Animal Industry deems advisable for the effectual working of the Plan.

11. Any animal which aborts in any herd under supervision must be immediately isolated and reported to the Bureau of Animal Industry. The place where the abortion occurred must be immediately cleaned and disinfected, the fetus and membranes must be properly disposed of.

12. Herd bulls must not be used for service in other herds.

13. All milk and other dairy products fed shall be either produced by an approved herd or shall be properly pasteurized.

14. Cattle from approved herds may be added without test. If shipped, the car must be cleaned and disinfected and public stock yards must be avoided.

15. In no case shall pregnant animals be added to a clean herd unless coming from an approved abortion-free herd. Pregnant animals, other than those from approved herds to be added, must be isolated until after having calved and must have passed a blood test not within two weeks after having calved.

16. All cattle other than those as provided in Section 14 and 15, to be added, must have passed a blood test approved by the Bureau of Animal Industry, must be isolated for a period of at least 60 days and must have passed the second test applied in accordance with Section 6.

17. Cattle removed from the farm for exhibition or any other purpose shall be provided with separate quarters and shall not be exposed to cattle other than those from approved abortion-free herds. If shipped, Section 14 must be complied with.

18. The premises must be in a sanitary condition. After the removal of affected animals, the stable must be cleaned and disinfected under official supervision.

19. If the owner desires it, a certificate will be issued for herds in which no reactors have been found over a period of one

year and which the history indicates are free from this disease, provided the above requirements have been complied with and the following agreement has been properly signed and executed

*Agreement of Owner with the Bureau of Animal Industry,
Pennsylvania Department of Agriculture*

I hereby agree to the terms of the above plan for the prevention, repression and eradication of Bovine Infectious Abortion. I also agree to observe and fulfill the foregoing requirements and I agree further: That failure on my part to comply with the foregoing shall be sufficient cause for cancellation of this agreement.

My herd consists of the following cattle:

	Purebred	Grades	Total
Females over 1 year of age			
Females under 1 year of age			
Males over 1 year of age			
Males under 1 year of age			

TOTAL

Predominating Breed.....

Date.....192... Owner.....

Witness..... Address.....

Name and Address of Your Veterinarian:

.....
(Name) (Address)

ESSENTIALS

It does not matter what method is adopted for the control of this disease, the future aim should be to eventually eradicate infectious abortion. With this aim in view, it will be more quickly accomplished by observing the following principles:—

1. Improvements in blood lines should be made as much as possible by careful selection within the herd rather than from outside sources, this excluding outside infection.

2. There should be provided a separate stable known as the maternity barn for cows at calving time. This stable should be so constructed that it can be easily and thoroughly disinfected, or better, fumigated with formaldehyde. On farms containing a large number of cows it should have sufficient number of completely separated stalls to accommodate the number of cows that would be calving at one time.

3. Every cow should be removed from the herd and placed in the maternity stable at calving time. Cows showing symptoms of abortion should be placed either in the maternity stable or in a hospital stable maintained especially for the purpose of animals showing evidence of disease. All cows placed in the maternity stable should be kept there until all discharges following calving have ceased.

4. All afterbirths and aborted or dead calves should be carried in a non-leakable container to a suitable place and should be well buried or burned immediately.

5. The maternity stall should be well cleaned and effectively disinfected or preferably fumigated before another cow goes into it. The manure and litter should not be placed in the exercise or feed yard.

6. The herdsman should observe all pregnant animals daily and should remove suspicious animals from the herd before any considerable damage has been done.

7. In case an abortion has occurred in a stable the cow should be immediately isolated, the fetus and membranes should be carried in a proper container to a suitable place and burned or buried, the stable should be well cleaned and disinfected. An abortion occurring in the pasture field should be handled in the same way. The earth at the point where the abortion occurred should be covered with three or four inches of lime or a strong disinfectant or both.

8. Every case of abortion should be considered infectious until otherwise determined.

9. Feed should be obtained from such sources and should be so stored that it will be insured against contamination with disease producing organisms.

10. Manure piles should not be stored in the exercise or feed yard. There should be no barnyard manure pile. No cow should have access to manure piles at any time.

11. Bull clubs should be considered as consisting of units and handled as individual herds. Members of bull clubs should exercise extreme caution as pertain to abortion and other transmissible diseases.

12. Herd bulls should not be used for service to neighbors cows.

13. If purchases are to be made the history of the herd from which one wishes to purchase and the individual animal history should be determined and if either is doubtful the purchase should not be made until the animal's health is definitely determined, and even then it is safer to purchase from healthy herds.

14. Pregnant animals should not be purchased unless isolated until they have given birth to a calf, have passed a satisfactory blood test not within two weeks after having calved, and the discharges following calving have ceased.

15. No person should be permitted to inject a vaccine or serum to prevent abortion. Vaccines and Bacterins cause reactions.

16. No animals susceptible to this disease should have access to neighbors' animals. All animals under supervision should be protected from neighbors' animals in such a way that there is no communication whatever.

17. The blood test should be applied at frequent intervals, and all reactors, both male and female, immediately removed, until all remaining animals have passed several consecutive tests.

18. Every reactor should be considered a carrier and every carrier should be considered a spreader.

19. Every cow in the herd should be considered a spreader at calving time until no reactors have been found over a period of at least one year.

20. Reacting animals possessing little value from a breeding standpoint or when unprofitable should be disposed of.

21. The value of animals of high merit warrants keeping them separate in order that the breeder may be benefited by their bloodlines obtained in offspring.

22. It is much easier to keep herds free from Bovine Infectious Abortion than to establish free herds from those which have become infected.

23. Prevention of disease is much more economical and more effective than cures.

24. Veterinarians, breeders and herdsman should be slow in becoming discouraged when attempting, by proper measures, to eliminate abortion infection from the herd.

25. Remember that it took some of our most modern live stock owners almost thirty years to understand that it is more profitable to maintain herds free from tuberculosis by the adoption of proper preventive and control measures than to maintain diseased herds. So will it take time for them to understand that it is more economical to keep herds free from Bovine Infectious Abortion.

FINANCING THE TUBERCULOSIS AND ABORTION ERADICATION WORK

J. A. PASSMORE, V.M.D., *Pennsylvania Bureau of Animal
Industry, Harrisburg, Pa.*

Doctors Bruner and Barnes have presented a very complete outline of the present and future plans for the eradication of tuberculosis and abortion. To carry out these projects as planned, will require considerable sums of money, not only for tuberculosis indemnity purposes, but also for administrative work.

Most of you are familiar with the difficulties encountered in obtaining money through the legislature.

In 1921 the legislature appropriated for the payment of indemnities for animals killed to prevent the spread of tuberculosis and glanders the sum of \$130,000, and for the maintenance of the Bureau of Animal Industry work the sum of \$338,000. These amounts were more than any previous legislature had appropriated, not including deficiency appropriations. During the period from 1921 to 1923 the interest and demand for the Bureau work had so increased that the \$130,000 appropriated for indemnity was exhausted within a year after it became available (June 1st, 1921). The work did not stop, however, but was retarded, and by the time the 1923 legislature convened, a large amount of indemnity claims had been incurred which could only be paid by asking the legislature for a deficiency appropriation. This was not good practice; furthermore, it made it a hard problem to get an adequate appropriation from the legislature for the next ensuing two years, with the deficiency appropriation being granted by the same legislature.

In January, 1922, the enforcement of the Pennsylvania Dog Law was placed under the supervision of the Bureau of Animal Industry. At the end of the first year of the enforcement of the Dog Law under Bureau supervision, it was found that over and above the expense of enforcing the Law, a considerable sum of money was collected and which under the Law at that time reverted into the General Fund of the State Treasury to be used for general purposes. The demands for the Bureau work had been steadily increasing, and those interested, after giving the matter considerable attention, concluded, that in as much as the

Dog Law revenue was derived through the enforcement of the Law by the Bureau of Animal Industry, it would be only a fair proposition to turn this money over to the Bureau to carry out the various activities. This would also place the Dog Law revenue where it would actually be used for the benefit of all the Counties of the State, and at the same time provide sufficient funds for the Bureau to meet the demands made upon them for the work with which they were charged. It was finally decided to amend the Dog Law and the 1923 legislature passed an amendment making all of the Dog Law revenue over and above that necessary for the enforcement of the Law, available for indemnity and maintenance of the Bureau. This increased revenue, estimated at about \$800,000, placed the Bureau in a position where the work could, with satisfaction, be planned and expanded to meet the steadily growing demands. Finances from this time on were in fairly good shape. However, the demands for the Bureau work increased with such leaps and bounds that it was found that even with the increased money available through Dog License revenue, additional revenue must be found or the work could not nearly keep up with the demands. By the time the 1925 legislature was ready to convene, sentiment had, through the growing knowledge of the value and importance of Bureau work, and through the activities of interested individual breeders and associations, crystalized to the point where it was possible to bring before the legislature such an earnest and imposing delegation for a hearing, that the legislature appropriated \$2,700,000 out of the general fund and \$300,000 out of Dog Law revenue; all for indemnity. The \$2,700,000 was later cut to \$1,799,000. To carry on the work involving the using of this large amount of money, made it necessary to find additional funds and again the Dog Law was amended appropriating out of the Dog Law revenue \$750,000 for maintenance.

This brings us to the present bi-ennium and I wish to call your attention to the importance of the Dog Law in connection with the financing of Bureau of Animal Industry work. In 1921, \$130,000 for indemnity and \$300,000 for maintenance was all the legislature would appropriate. In 1923 the Dog Law saved the day. This was the year when all appropriations were cut to the bone in the efforts to keep the expenditures within the revenues at that time. Had it not been for the Dog Law, instead of receiving around \$800,000, undoubtedly the appropriation would have been less than the amount granted in 1921.

When the larger indemnity appropriation was suggested in 1925, it was the Dog Law which again saved the day with the

\$750,000 for Bureau of Animal Industry maintenance. Those of you who have had experience in connection with obtaining appropriations, know the many demands made on the legislature. Regardless of the interest shown and the facts given at the hearing before the legislature committee, if it could not have been shown that the Dog Law revenue would take care of the administration work of the Bureau of Animal Industry, or if there had been no Dog Law at the time, the legislature would probably have appropriated for both indemnity and administration not more than the amount now appropriated for indemnity alone.

Gentlemen, this is one of the several reasons why all should actively support the Pennsylvania Dog Law. Aside from the fact that the Dog Law is raising the revenue to enable the Bureau to carry out the work as now planned for the benefit of the Livestock Industry in which you all are so interested, the Dog Law also protects your property and provides the means for reimbursing you for losses through having livestock or poultry killed or injured by dogs.

Your attention is called to this chart, which shows the number of licenses issued since the Dog Law has been under Bureau supervision; also the amounts paid out to owners of livestock and poultry for losses caused by dogs.

<i>Year</i>	<i>Licenses</i>	<i>Amount Paid For Damages By Dogs</i>
1922	347,847	\$50,889.57
1923	405,804	66,926.35
1924	469,833	71,826.09
1925	479,000	77,467.20

The steady increase shown in the number of dogs licensed is due to the more general knowledge and observance of the Law through the vigorous enforcement. Last year there were approximately 184,000 more dogs licensed than when the enforcement of the Law was under County supervision. The amount paid out for losses caused by dogs is not a small item and when you realize that without a Dog Law such losses would fall upon the individual, you will agree that this is another good reason why you should be interested in the enforcement of this Law.

The gradual increase shown in the amounts paid out to owners of killed or injured livestock and poultry would appear to indicate more damage was being caused by dogs. Quite a large portion of these increases cover payments made for poultry. Increased poultry claims are due to the fact that most Counties, when the Law was under their supervision, refused to recognize

poultry claims, and during the last few years, it has become more generally known that compensation could be obtained from the State. Where formerly, persons suffering such losses made no effort to obtain indemnity, they now practically all make claim. This also applies to a certain extent to livestock losses. Furthermore, a considerable amount of this money has been paid for sheep and you are all aware of the increased value of sheep during the last few years. The actual losses are gradually being reduced.

In conclusion, I want to impress these facts upon you all. The demand for Bureau of Animal Industry work is rapidly increasing and to carry out the plans made for the eradication of tuberculosis and abortion, as stated before, means the need of considerable sums of money in the future. The eradication of tuberculosis alone will call for millions. The demand for abortion work is rapidly increasing and may in time be as great and pressing as that for tuberculosis eradication. I have endeavored to give you a brief history of the financing of this work in the past; the future will be in the hands of organizations such as is gathered here today.

Because a generous appropriation was granted by the last legislature, does not mean that it will be granted again just for the asking. Every year the demands increase for moneys for this and for that purpose. The hunt for sources of revenue for governmental purposes has almost reached the limit. You have good friends in the legislature, but their efforts must be strongly supported. If sufficient funds are to be obtained to carry on the important work discussed this morning, the organized efforts and interest as shown at the hearing before the last legislature must be further increased and supported.

I trust you will realize the importance of the Dog Law, not only in connection with the financing of the tuberculosis and abortion work, but also for the protection of your property, and I hope upon your return to your homes, you will impress upon your friends and neighbors, what the proper observance of the Dog Law means to everyone.

HOW BETTER BULLS REDUCE THE COST OF PRODUCING MILK

S. J. BROWNELL, *Dairy Extension Specialist*, State College, Pa.

The first requirement for profitable production is an efficient machine and undoubtedly the next most important essential is to operate the machine intelligently.

It is evident that most farmers consider that there is a wide gap to be crossed when we consider profitable milk production and its relation to the herd sire. This idea is far from the truth. The bull is as great a factor in the cost of production of milk as any other single item.

When we study the machine that is used in producing milk we analyze the dairy cow herself. We find that every individual is determined by three forces, viz., (1) selection, (2) environment, (3) heredity. Of these three forces the greatest limiting factor of profitable production is heredity. It is impossible for any animal to produce more than her inherited ability.

For example if we consider Aberdeen Angus as a milk producer we find that regardless of the manner in which she is fed it is impossible for her to produce as efficiently as the so-called dairy breeds. It is likewise impossible to get Holsteins to produce consistently the butterfat tests of the Guernseys or Jerseys. It is likewise impossible to get Jerseys or Guernseys to produce consistently the quantity of production which we find in the Holstein. Each breed produces according to its inheritance, also each animal produces in quantity of milk or butterfat according to her inheritance.

From this we can see that the inheritance of the herd limits the production of the herd. We find from the record obtained by the Farm Management Extension office that the cost of producing milk is in relation to the average production of the animals in the herd. These records show that it costs 25 cents a pound more to produce butterfat from cows which produce 150 pounds of fat than it does from the cows which produce 300 to 350 pounds of butterfat. They also show that it costs six cents a pound more to produce butterfat from cows that produce between 300 and 350 pounds of butterfat than it does to produce butterfat from cows which produce between 350 to 400 pounds. It is also shown that it costs five cents a pound more to produce

butterfat from cows which produce 350 to 400 pounds than it does to produce butterfat from cows which produce 400 pounds of butterfat or more. Therefore, it is reasonable to suppose that herds which have the greater inheritance to produce very materially decrease the cost of production."

In order that the dairy herds should have the greatest possible inheritance for milk and butterfat production it is necessary that each generation of animals born in these herds have a greater inheritance to produce than their mothers. In order to make this possible it is necessary that the herd sire shall have an inheritance greater than that of any of the cows in the herd. With a sire of this kind in the herd each generation of daughters are reasonably insured of being greater producers than their dams.

To find a sire of this kind we have described the four different kinds of sires that are used in the Pennsylvania herds in the exhibit here at the Farm Products Show. The first of these sires is the average bull of no particular ancestry but usually out of some farmer's good cow. This bull is usually maintained merely for the purpose of enabling the cows to freshen once a year, and incidentally to keep some of his best calves. The production of a sire of this kind is around 150 to 200 pounds of butterfat.

The second sire is just a purebred bull. He is a bull with registration papers and that is all. These bulls used on the inferior herds are doing considerable to increase the production but in the herds of the better dairyman they show no material increase in production over the 350 pound fat herd. The average production of the daughters of this kind of a bull is 8608 pounds of milk and 347 pounds of fat. Of the 2016 daughters sired by pure bred bulls we find that they show an increase of production of but 3.13% more milk and 4.2% more butterfat. This is almost a negligible amount when the difference in cost of production is considered. It is also shown from these records that approximately 50% of these bulls decreased the production of their daughters compared with their mothers.

The third bull is a bull with a pedigree of production written of his ancestry for several generations. This is the kind of bull which we are selecting for bull association work. The average production of these bulls is 11,947 pounds of milk and 396 pounds of butterfat. This production is a 27% greater milk production than the mothers of the heifers and a 13.5% greater butterfat production than their mothers. Thirty out of 36 of these bulls increased the production.

The fourth kind of a bull to be considered is the proven sire. In looking over the cow testing association records we find

that the proven sire is very hard to find. New proven sires have been located in Pennsylvania during the past year. These sires are very much in demand. A representative sire of this group is owned by the College and shows an average production for all of the thirteen daughters which are in milk in the herd of Mr. Otto, of Carlisle, Pennsylvania, of 15,134 pounds of milk and 515 pounds of butterfat. This production is 107% increase of milk production over the average cow testing association cow and 80% increase in butterfat production.

HOW SHALL I CONDUCT A FIVE YEAR PROGRAM TO IMPROVE MY HERD

C. G. GEARHART, *Dairy Extension Specialist*
State College, Pa.

Thousands of dairymen have and are using their best judgment on this topic every year with varied success. Conditions vary on every farm making it necessary to work out a different program for every farm. I have, therefore, simply prepared an index or an outline which I hope will be of some assistance in working out a practical program for your own herd.

This outline is divided into five main projects. (1) Cropping System. (2) Commercial Feeds. (3) Cattle. (4) Care. (5) Records. All five of these projects must be watched by the farmer at the same time. I wish to state here that is why we need just as keen thinking, steady and thorough going men at the head of our dairies as at the head of any other industry. I said I divided this into five main projects, probably I should have said six, making the dairyman himself the most important one.

Every dairyman should be in love with his work. The interest, patience, and love that a dairyman shows for his cattle will be a big factor in his success. A real dairyman will find more pleasure in caring for his cattle than playing cards, watching a football game or a horse race. He will not express his wishes with sticks, stones, or a milk stool. On a bad rainy day when he is rushed with extra work he will pause by a calf standing in a wet dirty pen long enough to give it a fork full of nice clean straw to lie on.

There is a question in my mind which is the most important one of these five projects and should be discussed first. All are essential in a well balanced long time program.

ROUGHAGES AND GRAIN

I believe I am safe in saying the *problem considered* most by our dairyman and *drawing heaviest* on his pocket book is *FEED*. My first suggestion is make a survey of your farm and cropping system.

The market for most dairyman's crops is his dairy cows and I am sure you will agree with me, "It is sound judgment to pro-

duce what the market demands and that of the highest quality." "What does this market demand?" An abundance of legume hay, hays high in protein, such as alfalfa, clover or soybean hay. It demands good succulence silage, and a grain ration supplementing this roughage that will satisfy and meet the requirements of each animal for both body maintenance and milk production.

Make a systematic plan to prepare field after field to grow alfalfa, if favorably located. If not use some other legume crops.

What are the requirements for alfalfa?

1. Lime
2. Good seed bed
3. High quality of seed and inoculation.

This will take several years and in the meantime use should be made of clover, soybeans for hay and sweet clover for pasture. Your legume crops, the manure from these legume crops, the lime and some acid phosphate help to make ideal soils for corn. That means economical silage and corn to supplement commercial protein feeds. This followed with some small grain, wheat or oats furnishing straw, a cash crop or a grain that will work in well with your ration.

COMMERCIAL FEEDS

This plan does not call for you to produce all the ingredients in your grain ration. I doubt if that would be practical. A good grain ration should be composed of a variety of feeds, supplying the protein, carbohydrates and fats in the proper proportion. It should be succulent and bulky and so far as possible economical.

Now here's an opportunity for the dairyman to use his best judgment. How much and what shall he buy? When is the best time to buy? He will need some linseed oil meal, cottonseed meal, bran or gluten or some high quality prepared feeds. Buy prepared feeds on quality and not cost per ton.

Feed the grain mixture in proportion to milk produced and all the legume hay and silage the cows will clean up.

CATTLE

I can't conceive of any dairyman adopting this feed plan without giving a thought to the improvement of his cattle which are the market for his crops. A wise dairyman will not be willing to supply a market which cannot be depended on, which holds out payments on him or is a burden on his pocketbook, yet isn't that what we are doing in many cases?

Is it true that one third of our cows are a burden to us as long as we keep them, that one third are on the fence probably paying for their feed, stable room and investment but nothing more leaving only one third of our cows paying a profit.

We have some cows that convert only 30% to 40% of the feed they eat into milk, using the other 60% to 70% for their body or passing it on undigested. Others are converting 50% of their feed into milk and our best cows as high as 60% to 70% using only 30% to 40% for their bodies. They are the cows we want. They will be found among the one third that educate our children and make us comfortable homes. They may be found dressed in disguise, not being the ideal dairy type and this makes our breeders' problem all the more complicated.

It's impossible for me or anybody else to go into your herds and pick out the highest producers on type alone. Many of our cows are getting by on (figuratively speaking) bluff. There is the cow that always looks good, the easy keeper, and the cow that gives an enormous amount of milk for a few months after freshening then dropping to a quantity that will keep the farmer from turning her dry, doing that herself about 2½ to 3 months before freshening. I believe that is the most deceiving cow we have in C. T. A. work because when a farmer thinks of her he always sees the large amount of milk she gave when she was fresh and then is very much surprised to find her among the poorest in his herd when the records are totaled. I might say this is often a dealer's money maker, as a rule she is sold when fresh. The farmer who knows her is willing to let her go rather cheap and the new owner pays a high price because he hasn't been told the whole truth.

What kind of a cow do we want? A very popular as well as a profitable cow is an animal that is medium, large, good dairy type and a persistent producer. A cow which will produce as much in her sixth to seventh and eighth month of lactation as during her first, second and third.

The average life of our dairy cows is about five lactation periods. This makes it necessary to add new animals to our herds from time to time.

There are two methods in general use: One is buying, the other is raising.

The buying method appeals to many of our farmers especially those selling whole milk. When they feel the need of another cow in their herd they buy one ready to milk, helping to increase or decrease their profits. There's no money spent on feed for growing heifers. No labor and worry lost on raising calves.

No worry about buying a sire that will produce good daughters.

It's the short cut method and probably the best method for many farmers who are dairymen from circumstance rather than interest in the work.

The buying method has its difficulties, however. Very few men can pick more than three good cows out of every five they buy. There is also danger of introducing diseases such as contagious abortion and tuberculosis. I might add that this method is more difficult and requires more cash to keep a high producing herd than by breeding.

The dairyman who is not blessed with an abundance of cash, whose cows must pay for improvements as they are made will find it to his advantage to raise enough heifers to replace the cattle leaving the herd.

This puts us face to face with the breeding game. Start as near as possible with the ideal type of cow and breed her to the best bull you can afford. Preferably one that has proven his value. We only realize the true value of the old saying "The sire is half the herd", when we get a poor one. A breeder's only hope of improving his herd is through the sire.

A breeder cannot stop here. A calf should be given some thought before it is born. See that it is well nourished through the dam, and when dropped give it some individual attention. See that it gets a good start and makes a steady growth. Your future herds will depend to a large extent on how your calves are raised. Our feed program should provide some good roughage and grain for our calves. A mixture of corn, oats, bran, and oil meal is often recommended.

Our next move is to breed these calves so they will freshen between 26 and 33 months old, depending on the breed.

Starting this program today it would be at least 1929 before the results of these first steps in the breeding game can fully be determined. Good sires bred to good cows means good calves. Good calves well raised mean good cows and good cows well fed and cared for mean success.

CARE

I've hinted once or twice at the importance of care. It costs little yet the dividends thereof are great.

It is not necessary that you have a new barn with the latest dairy equipment in it, but it is important that your barn is comfortable, warm enough in winter so the manure will not freeze and ventilated well enough to keep the air from getting foul.

Foul air will make a cow feel sluggish the same as a man and in that condition she cannot do her best.

Mr. Glover once said "Conditions in your barn are not as they should be until you can take your cot, sleep in one of the stalls and come out feeling fine."

RECORDS

This program or in fact any improvement program, would be incomplete if sufficient records were not kept to determine the progress which is being made.

How much faith would we place in experiments run by our Agricultural College or any other concern if there were no records kept?

Had no records been kept by the men studying feeds and their effect on animals I'll grant you we would not be feeding our dairy cattle as we do today.

Every cow in your barn is an individual factory returning different dividends and it is only by a systematic form of record keeping that we will be able to eliminate the boarders, the bluffers, and especially the cow that is near the border line.

It's the only way to determine if the herd is improving and of knowing if the sire is producing daughters that are better than their dam.

Without records one can only guess which feed is giving the best results, which cows are keeping the herd test up, and which are the best cows to raise heifers from.

Many farmers find the keeping of records difficult. That is one reason why so many of our progressive dairymen are in Cow Testing Association Work. It is the simplest, surest, and cheapest method of keeping record and should have a permanent place in our long time program.

Here are the records from a herd that has raised the herd average from 248.5 to 413.4 pounds of butterfat in eight years. The average ran as follows: 248.5 pounds of butterfat the first year, 285.6 the second, 283.1 the third, 300.1 the fourth, 387.1 the fifth, 408.1 the sixth, 379.8 the seventh, 413.4 the eighth, 441.0 the ninth.

Every cow has a page of her own, every year showing her production, feed consumed, income over cost of feed, a breeding record, and some other fundamental data in regard to herself. This makes it very easy to study her production from year to year, her production by lactation periods, etc.

This is only one example out of many.

In Juniata county there are ten members who have six years continuous, their averages running as follows:

Year	Milk	Fat
1920	6444	227.6
1921	7693	268.0
1922	8570	301.7
1923	8754	294.5
1924	8983	304.7
1925	9098	320.6

In conclusion I would say *start* with your farming system. Have plenty of feed on hand, improve your cattle. Give them comfortable quarters and tender care, and check on every animal.

A BALANCED POCKETBOOK—MILK VS. FEED

R. H. OLMSTEAD, *Dairy Extension Specialist*, State College, Pa.

To make money from the feeding of dairy cattle we must first start with an efficient machine. If a cow does not really have the ability to produce a good quantity of milk, correct feeding will not make her produce much better. Cows that have the ability to give milk but are fed in a haphazard way will increase their production on correct feeding and will make more money as a result. It will also lower the feed cost of production which means greater profits.

WATER

Water should be emphasized strongly in dairy feeding. A cow in production will respond quickly to an increased consumption of water. When we consider that milk is 87 per cent. water that really speaks for itself. Watering cups should be in every dairyman's barn who has water so he can use it in that way. They will soon return their cost. If watering cups cannot be used, hot water should be added to the watering trough before watering the cows in milk. This will remove the chill thus enabling the cows to drink a greater quantity of water than they would otherwise. This has proven most profitable with a great many dairymen. It is often the inexpensive things like water that are most neglected on the average dairy farm.

ROUGHAGE

The greatest improvement in feeds that can be made on the average dairy farm is the growing of a better hay. Too many dairymen are feeding corn stover, timothy and lightly mixed hay. When this is done more money must be expended for high protein feeds to balance up their poor roughage. It is estimated that the average dairyman with fifteen cows must pay out monthly about \$58.00 for high protein feeds to go with his corn and oats when he is feeding timothy hay. With alfalfa hay he need only pay out about \$26.00 to balance up his corn and oats. Then, too, there is something about alfalfa that gets more milk out of cows than we can get in any other way. It also supplements the other feeds so that they seem to be of greater feeding value. In addition to alfalfa we have a great dairy feed in soybean hay.

This is more of an emergency crop to be put out when we do not have alfalfa or good clover. In feeding value soybean hay is equal to alfalfa. Good clover hay is the old standby and should be grown on every farm. It stands in feeding value next to alfalfa and soybeans.

AMOUNT TO FEED

One of the greatest savings that can be made in dairy feeding is to feed according to a cow's production. A low producer should not be fed as much as the cow that has the ability to produce a lot of milk. If they are fed alike the low producer will wipe out the profits of the high producer. Feed the good cows all that they need and cut down on the feed of the low producers. Feeding one pound of grain to each 3 or $3\frac{1}{2}$ pounds of milk daily for Guernseys and Jerseys and one pound grain for each 4 or $4\frac{1}{2}$ pounds of milk daily for the Holsteins and Ayrshires is about right. The grain mixtures will vary depending somewhat on the breed of cows, kind of roughage on hand, and home grown feeds available and prices. If anyone desires a ration they should write to Mr. Olmstead, at State College, stating their breed of cows, roughage, and feeds available.

There are a great many commercial feeds on the market that are put out by honest and intelligent manufacturers. These should be purchased on a basis of quality and feeding results. In fact, any ration whether home mixed or commercial should be judged by actual feeding results. The only person who can do this is the one who feeds the cows and the only way he can is to keep some simple records to see which feeds return him the greatest amount of milk per dollar expended.

WILL THE RETURNS FOR A HIGHER QUALITY OF MILK PAY FOR THE INCREASED COST OF PRODUCING IT?

C. I. COHEE, *Director Department of Quality Control,*
Philadelphia Inter-State Dairy Council, Philadelphia, Pa.

When those who were arranging for this meeting selected this subject for me, undoubtedly they were voicing a question which has been in the minds of a great many dairy farmers throughout Pennsylvania and other sections of the Inter-State Milk Producers' Association territory, who, during the past two years, have been asked to make a great many changes on their farms looking toward the improvement of the quality of the product.

It is quite natural when the dairyman is asked to make improvements on his farm that he should ask the question whether or not he is to receive additional compensation for his milk which will return him a profit on his added investment. I would like to be in a position to assure him definitely that on a certain date the price of milk would advance to meet the additional cost thus involved. Unfortunately, however, we must all realize that this is impossible and we must view the question from the angle of whether or not he is going to be compensated for the extra effort and expense he is putting into this work at once or over a period of years.

We must also consider it from the angle of what is transpiring in other milk markets adjacent to the Philadelphia district and ask ourselves the question of whether we are going ahead of neighboring cities in improving the quality of milk and therefore have a right to expect a higher return to the producer than that paid in other cities, whether we have been just keeping pace with the improvement that is going on all around us, or whether we have been lagging behind.

I am of the opinion that for a long time the Philadelphia market was not as actively interested in improved quality as it should have been. Some of the neighboring districts—like New York, Washington, and to some extent Baltimore, were going

ahead on this problem even so far as having very strict regulations covering the production and handling of milk, whereas Philadelphia until recently has remained passive to this question.

This would raise the question of whether a definite program looking toward the improvement of quality was necessary in order to preserve the market for the dairymen who have been producing milk for the Philadelphia market. It would seem that they were perhaps in great danger of losing their market to milk from other districts where apparently more effort has been made to improve the quality.

So I think we should view the question of improved quality from the angle of preserving the present market to the producers in the district of which I am speaking. If, through this improvement in quality, we may preserve the market for our dairymen adjacent to Philadelphia and now shipping their milk to Philadelphia and other cities in the territory, they will be paid a profit for their investments by reason of having their market maintained for them.

There is again another angle from which we might view the situation. Philadelphia is a market that appreciates quality and apparently is willing to pay a fair price for quality products. This fact is well illustrated when we stop to consider that Philadelphia consumes more ice cream per capita than any other city in the United States or, in fact, in the world, as far as we know. This tremendous consumption of ice cream is due almost entirely to the quality of the product that has been offered to the public in this district. Philadelphia ice cream is known the world over and in various sections of the United States you will frequently see the statement used by ice cream manufacturers "Philadelphia Ice Cream", thus illustrating that Philadelphia ice cream is a high standard with which to draw comparisons.

The same thing is true of other dairy products, particularly butter. Something over 25% of all the butter consumed in Philadelphia is of 92 score or better. Here again it is illustrated that Philadelphia is a market which appreciates quality. I cannot conceive how a market which appreciates quality and is willing to pay for quality in ice cream and butter, can fail to appreciate a high quality of milk and be willing to pay a price that will justify the producer for furnishing the high quality of product desired. In fact, I am of the opinion that already the consumer appreciates the improved quality of milk in Philadelphia and is compensating the producer in a substantial manner for the extra expense and labor involved in order to provide milk of a superior quality.

Undoubtedly, it is easier to increase the sales of high quality products than that of low quality products, even though the price be higher. This is well illustrated in the development and sales of "A" milk in the Philadelphia district. It is estimated that approximately one-third of all the milk consumed in Philadelphia is of this higher quality, known as "A" milk. Assuming, however, that only one-fourth of the milk consumed in Philadelphia is of this higher quality, let us stop and think for a moment what this means to the producer. If one-fourth of Philadelphia's milk consumption is "A" milk, based upon the prevailing bonuses paid over and above the regular price paid for milk, the added income which the producer receives is something like \$1,650 per day, or approximately \$600,000 per year.

Based on a very conservative estimate, that is the amount the Philadelphia dealers alone are paying over and above the regular Inter-State Milk Producers' Association market milk price for a product of a superior quality. This \$600,000 annually in bonuses points to why we should continue to improve the quality of the product.

Unfortunately, not every dairyman is so situated that he has an "A" milk market available, so that he cannot take immediate advantage of this opportunity to secure an added return to compensate him for his additional expense in producing a high quality of milk.

First of all, let me say that there is very little additional cost in producing a high quality of milk. It is a well demonstrated fact that it is not necessary for a man to have expensive equipment in order to produce milk of a superior quality. He must, however, exercise care, good judgment and clean methods in the production of his milk. The application of clean methods and proper cooling is not a matter of great expense, but these are the first two factors to be considered in improving quality.

The question naturally arises, why, if these are the two most important factors, do we have any regulations? There are many dairymen who have produced milk of a superior quality without legislation or regulations, but it is, of course, impossible to enforce certain requirements upon the careless producers and not carry out the same requirements on the farms of the dairymen who do not need supervision in producing their product. So regulations are therefore drawn up in various communities and must be enforced.

In the Philadelphia Milk Shed we have tried to have regulations that, while they do not require large expenditures of money for improvements on the farm, do cover the essential needs of the

dairyman for the proper equipment and methods for the production of milk. We are trying to give the consumer the utmost protection with the minimum of expense to the producer, and while many dairymen look upon the building of a milk house, white washing of stables, keeping cows clean and matters of that kind as a hardship, progressive dairymen everywhere recognize these requirements as essential on a good dairy farm and nothing more than should be expected in the way of insurance to the consumer that the product he is consuming is produced under conditions that are sanitary.

Four years ago in parts of the Inter-State Milk Producers' Association territory which supplied milk to Philadelphia, there were times of the year when as much as 40% of all the milk produced in certain counties for shipment to the market was rejected at the country receiving station because it did not meet the consumers' demands as to quality. This involved a tremendous loss to the producer. Today this situation is corrected, and in 1925 in this same territory seldom more than 1%, and never more than 10% of the milk, was rejected.

Regulations alone did not bring about this change. Nor will regulations alone, in my judgment, ever give the Philadelphia market, or any other market, a superior quality of product. Regulations, combined with education of a character which the producer recognizes as being helpful to him in improving his product and thus securing a greater return for his efforts, will, I believe, meet with the greatest success and will return to the producer the greatest profit for his product.

A satisfied customer is a good customer, whether he is the consumer who drinks the milk in the city, or the dealer who buys the milk from the producer.

Co-operative regulations, together with sound co-operative marketing, in my estimation point the way to better markets, better prices, and a better appreciation of what the consumer wants, what the dealer must have to satisfy the consumer, and what the farmer needs to produce in order to enjoy a good market and a profit from his dairy.

DAIRY BARN IMPROVEMENT

N. S. GRUBBS, *Agricultural Engineer*, Portland Cement Co.,
Philadelphia, Pa.

The investment in farm buildings is so heavy that more attention should be given to this end of farm practice. During the past ten year period a tremendous advancement in building values has come about due to advanced labor wages, increased town and city values and to a scarcity of building material commonly used in farm structures. In times past farmers cut their own timbers, placed their own stone foundations and raised their own barns. Today this is almost a lost art among our young farmers. Conditions in the construction of dairy buildings are rapidly changing. Concrete products, clay tile, metal and similar fire resistant materials are finding their way into buildings that were formerly made of home produced products. Last year the farmers of this country used over 130,000,000 bags of cement, enough to build a concrete pavement three feet wide that would go around the world $5\frac{1}{2}$ times. Twenty-five years ago practically no cement was used by the farmers of this country.

The barn along the road side is the storehouse of the nation. Over six million farms in the United States have buildings in which is stored livestock and farm products constituting one of our nation's chief assets. Of the two in the East, farm lands and buildings, it is of interest to note that buildings represent the larger investment. Today farm buildings have a higher value than the land itself. According to the last U. S. census in Pennsylvania, land is valued at \$559,861,344 and buildings at \$616,796,204.

A lot of study, experimental work, labor and money is expended yearly on our soils to keep them in a high state of productivity. It appears now that our buildings should be given more attention in order to keep them in good repair and fit for the purposes for which they were built.

A carrying charge on all farm buildings in Pennsylvania amounts annually to \$60,000,000 which includes interest on the investment, insurance, taxes and depreciation.

In a survey just completed on 200 representative dairy farms in Pennsylvania, it was found the average dairy farm contained 140 acres, 4 horses, 18 cows in the herd with dairy barns valued today at \$4,420.00 each.

On a per cow basis the investment in land figures at \$154, while the investment per cow in buildings is \$170. This means a carrying charge on buildings per cow of over \$17.00 annually, which includes taxes, insurance, interest and depreciation.

On the 200 dairy farms we find 145 wooden barns, 15 stone barns, 2 brick barns, 3 tile barns and 5 concrete barns. Thirty-five per cent. of the barns were built about 1880, forty-two per cent. about the year 1900 and twenty-three per cent. since 1900.

A study on silos reveals the following tables: 192 silos are used on 180 farms of the 200.

65%	are wooden construction, worth	\$385.00 each
12%	are clay tile construction, worth	695.00 each
6%	are brick construction, worth	375.00 each
4%	are concrete construction, worth	400.00 each
3 1/2%	are metal construction, worth	414.00 each

Most of these silos have been built since 1915.

On the 200 dairies was found:

53	milking machines
83	drink bowls
58	litter carriers
115	modern stanchions.

In seventy-two cases the ventilation system was reported to be unsatisfactory while in one hundred and eight cases the ventilation seemed to give good results. In most barns, windows, doors and hay chutes constitute the system of air circulation. Five barns contained the King system, a few others similar systems of ventilation. Cracks, open windows and the open shed type of barn was seldom mentioned.

The almost universal demand in Pennsylvania is for the two story bank barn of the Gambrel type. The one story barn with an adjoining storage barn is desired by only a very few farmers. About one-third of the farmers are satisfied with their building investment, one-third think they have too little invested in their dairy barn, while the other one-third think they have too much invested in the dairy barn.

CONCLUSION

The requirements for a successful shelter are the following:

1. A warm, convenient, economical, well lighted and well ventilated barn.

2. A permanent and fireproof structure.
3. Labor saving equipment.
4. A barn that is capable of producing clean milk.

SUGGESTED FEATURES FOR IMPROVEMENT

A. There should be sufficient window space to admit plenty of light and sunshine and in most cases these windows may be used as part of the ventilation system.

B. If the walls surrounding the cattle are of concrete or stone, a concrete slab over the cattle will serve as a fire barrier and at the same time furnish a tight, rat-proof floor for the mows above.

C. Concrete floors and mangers are universally accepted as almost essential in any well regulated barn. They should be properly made with good materials.

D. A satisfactory system of ventilation is a big factor in maintaining healthy, profitable herds.

E. A good roof is just as important as any part of the dairy building. Many fires are attributed to leaky roofs and stored crops should be kept from bacterial action due to the presence of moisture.

A group of neatly arranged, not necessarily expensive, farm buildings add to the looks of the farm and they are an index to the character of farm operations practiced by the farmer. This is especially true of the dairy farmer who markets his milk in local whole milk markets.

DAIRYMEN'S BANQUET PROGRAM

Masonic Temple, Harrisburg, 7:00 P.M., January 20, 1926

A. A. BORLAND, Professor of Dairy Husbandry, Pennsylvania State College, *Toast Master*

Fifty Years of Rural Pennsylvania—R. L. Watts, Dean of the School of Agriculture and Director of the Experiment Station, State College, Pa.

Problems and Prospects for Pennsylvania Dairymen — R. W. Balderston, Secretary of the Inter-State Milk Producers' Association and the Philadelphia Inter-State Dairy Council, Philadelphia, Pa.

The Changing Order—F. P. Willits, Secretary of Agriculture, Harrisburg, Pa.

Taking the Blue Sky Out of Dairy Records—C. L. Burlingham, Assistant General Manager of the Breeders Gazette, Chicago, Illinois.

"The Farmer and the State" — Gifford Pinchot, Governor of Pennsylvania, Harrisburg, Pa.

Announcement of Winners in Market Milk and Dairy Products Exhibits — George Taylor, Dairy Extension Specialist, State College, Pa.

Announcement of Trophies to be Presented to the Three Most Outstanding Bull Associations in Pennsylvania for 1926—S. J. Brownell, Dairy Specialist, State College, Pa.

Presentation of Awards to Owners of High Producing Herds in Cow Testing Associations—C. R. Gearhart, Dairy Extension Specialist, State College, Pa.

Dutch Dialect Readings—Rev. W. E. Peffley, Harrisburg, Pa.

Music—Quintet from Department of Agriculture; C. R. Hansen, E. R. Engle, R. L. Houtz, M. W. Copeland, G. T. Kuhlman, Jr., H. E. Gensler, Accompanist.

Music—Harrisburg Technical High School Orchestra.

Song Leader—H. C. McWilliams, County Agricultural Agent, of Cambria County, Ebensburg, Pa.

Committee in Charge of Banquet—Robert F. Brinton, West Chester, Pa., Treasurer Inter-State Milk Producers' Association, Philadelphia, Pa.; G. H. Truckell, Secretary of Pennsylvania Federation of Holstein-Friesian Clubs, Harrisburg, Pa.; Henry Fielden, Secretary of Ayrshire Breeders' Association of Pennsylvania, Telford, Pa.; M. J. Grimes, Secretary of Columbia County Guernsey Breeders' Association, Catawissa; C. A. Fox, Secretary Pennsylvania Jersey Cattle Breeders' Association, Pocopson.

FIFTY YEARS OF RURAL PENNSYLVANIA

R. L. WATTS, *Dean of the School of Agriculture, and Director of the Experiment Station, State College, Pa.*

Rural Pennsylvania is progressing. There is no question about that. It seems particularly appropriate, therefore, as we are entering the second quarter of the 20th century to review briefly some of the achievements of the past 25 years and also, in the light of past accomplishments, to venture a few prophecies concerning future developments. In other words, looking forward 25 years by looking backward 25 years should be of interest to all Pennsylvanians who believe as I do that this is the best and the greatest State in the Union, and, furthermore, that greater progress will be made in rural Pennsylvania the second quarter than has been achieved during the first quarter of the present century.

GENERAL FARM CROPS

Satisfactory farm profits are impossible without satisfactory yields of crops. In this respect Pennsylvania agriculture has made notable progress.

In the year 1900, corn in this State averaged only 25 bushels to the acre, while in 1925 the yield averaged 51 bushels. For the five year period ending in 1904, the average annual yield was 32.3 bushels an acre, while for the five year period ending in 1925 the average annual yield was 43.8 bushels. In Iowa, the greatest corn state in the Union, the yield in 1925 was 45 bushels an acre.

The wheat crop of Pennsylvania yielded at the rate of 13.5 bushels to the acre in 1900 and 20 bushels in 1925. For the five-year period ending in 1904 the average annual yield to the acre was 15.2 bushels and for the five-year period ending in 1925 the average annual yield was 18.3 bushels to the acre.

The advancement in potato culture has been even more marked. In 1900 the Pennsylvania farmer harvested on an average only 58 bushels to the acre, while in 1925 his average yield was 121 bushels. For the five-year period ending in 1904 the average annual yield was 80 bushels to the acre while for the five-year period ending in 1925 it was 107.6 bushels. In this connection it should be noted that the Keystone State now occupies second place in the production of potatoes.

LIVESTOCK

It has often been said that the rank and file of our Pennsylvania farmers are more successful as crop producers than as livestock men. Statistics on the subject support this statement, for only 2.9 per cent. of the swine, 3.1 per cent. of the sheep, 5.3 per cent. of the beef cattle, and 5.7 per cent. of the dairy cattle are registered. Undoubtedly, there are many purebred animals in the State that are not registered and there are also large numbers of grades. We have reason to believe that marked progress will be made during the next 25 years in the improvement of the livestock of the State, for our farmers now realize as never before the importance of well-bred farm animals of all classes. We point with pride to the progress that is being made in the eradication of tuberculosis among dairy cattle and also to the improvement of market milk and methods of distribution.

POULTRY

No branch of agriculture has made greater progress in Pennsylvania than the poultry industry. In 1900 there were comparatively few well-bred flocks, while today thousands of farmers boast of their fine flocks of high-producing strains. It has been estimated that the hens of this State are laying on the average at least 20 more eggs a year than they did as recently as 10 years ago. Marked improvement has also been made in the grading and marketing of eggs and poultry.

HORTICULTURE

One of the greatest advancements in horticulture has been in the improvement in varieties of fruits, vegetables, and flowers.

In 1900 practically all the tree fruits produced in the State were grown in farm orchards containing many varieties and receiving very little attention. Today, there are hundreds of large commercial orchards which receive thorough and scientific management, thus enabling the owners to place on the market products of superior quality. Special advancement has been made in methods of marketing fruits.

Market gardening has kept pace with other lines of agriculture. Labor-saving devices, improved methods of controlling insect pests and fungus diseases, better transportation facilities, and hundreds of good markets within the State made commercial vegetable gardening more promising than at any time in the past.

COOPERATION

The total cooperative buying and selling transactions of Pennsylvania farmers amounted to \$32,409,000 in 1924. Among

the products sold cooperatively may be mentioned milk, fruits, vegetables, eggs, wool, and potatoes. About 41,400 farmers are members of cooperative associations and the number is increasing rapidly. Cooperation will continue to grow wherever the business is handled on a sound economic basis.

FORESTRY

In 1860 the Keystone State ranked first in the production of timber. By 1900 we had dropped to fourth place, in 1918 to twentieth, and in 1925 to twenty-seventh. At present we are using timber at least five times as fast as we are growing it. We have pursued a wasteful policy in the harvesting of this valuable crop. Not only has there been great waste and destruction in harvesting and manufacturing, but for many years we permitted forest fires to sweep over vast areas, which killed billions of useful seedling trees and destroyed the humus which is so essential to the growth of valuable species. In recent years we have begun to realize the importance of our forests in supplying wood, in preventing floods, in conserving the water supply, in furnishing cover for game and fish, and in providing wholesome recreational facilities for our millions of people. A sound forestry policy is being followed by the State and it is of the greatest importance that the \$25,000,000 Forestry Bond issue be approved at the polls in 1928 in order that the State may acquire, protect, and develop a tremendous area of cut-over and burned-over forest land which is now yielding practically no income. The farmers, too, should adopt a policy of utilizing every acre of land, not required for crops or pasture, for the growing of timber.

GAME AND FISH

Pennsylvania must have been a happy hunting ground for the Indians, for it provided the finest conditions for a great diversity of game. Then the early settlers, woodsmen, trappers, and faulty hunting laws caused some of the most valuable species of game, such as deer and bear, to become almost extinct. In 1905 only a few hundred deer were killed in Pennsylvania, while in 1925 the legal kill amounted to 8,252. Other large game killed in 1925 includes the following:—Bears, 470; turkeys, 3,441.

On account of the great increase in the number of deer in some sections, special measures have been enacted by the Legislature to protect the orchards and crops from the ravages of these animals. This is a serious question on which there should be closer cooperation between farmers and sportsmen.

Many of the finest streams in Pennsylvania have been polluted beyond possibility of redemption, and a vigorous policy will be necessary to save the remaining streams.

It cannot be said that fishing is better than in the past, though great credit is due to the State Board of Fish Commissioners that the situation is not much worse. Millions of fish are planted in our waters annually. In 1924, 326,477,497 trout, bass, perch, sunfish, and other species were distributed by the hatcheries in the streams and lakes of the State. With the construction of new hatcheries now in progress, increase in the number of wardens, and a vigorous fight against stream pollution, fishing conditions should improve.

TRANSPORTATION

Rural Pennsylvania is exceedingly fortunate in having such a wonderful system of improved highways. They are of tremendous advantage in the marketing of farm products. They enable thousands of farmers to reach with ease, comfort, and economy markets that are unexcelled anywhere in the world. Furthermore, where the roads are kept open through the winter season, commodious farm storage houses will be constructed during the next 25 years, so that storable products, such as apples, potatoes, cabbage, and the root crops, can be distributed as the markets require. Wherever there are hard, smooth roads farm profits should increase.

The value of good roads has been so well demonstrated that every effort possible should be made to extend them through communities which do not now possess such advantages. It should also be noted that 160,774 farmers in Pennsylvania have automobiles.

COMMUNICATION

It is doubtful whether any one of the recent achievements of science has given the farmer more thrills than did the rural delivery postman, years ago, when he drove up for the first time to Sam Smith's farm on the always muddy trail in Lonely Hollow. It was almost unbelievable that this employee of Uncle Sam would return the next day and the next and every day except Sunday, delivering mail to Smith and his neighbors without extra cost, and receiving whatever mail they had to send. It was truly a great day for the farmer. Since then the establishment of the parcel post has made the service even more valuable.

Then came the rural telephone which made it possible for Smith to call the hardware dealer in town, explain to him that he

had just broken a plow point and request him to send a new one with the parcel post man. Smith's wife was also a wee bit weary of the isolation of the home in Lonely Hollow and now she could visit with her good neighbors, with probably many others "listening in" on her confidential chat with her dearest friend. About 124,000 of the 200,000 farmers in Pennsylvania have telephones and the number is rapidly increasing, thus indicating the trend toward social and economic advancement in the country.

And, now, another great advancement has been made in rural communication, for not only can Smith and his family in Lonely Hollow get the latest news of his farm community but he receives the market reports every day and at night in his own cozy home can enjoy the greatest lecturers, the best preachers, and the finest singers and musicians of New York, Philadelphia, and other cities, perhaps thousands of miles away from his home. The latter part of 1924, 10,378 farmers in Pennsylvania had radio-receiving sets. No doubt, the number is much larger now and will continue to increase until a large percentage of our farm homes will be equipped with this marvelous invention.

RURAL SCHOOLS

Many of us received our earliest education in one-room rural schools. When a master teacher is in charge, it is an institution of very great service. However, in the light of modern developments, we are forced to admit that the one-room school is not comparable in educational advantages to the graded, consolidated school.

At present there are 8,548 one-room schools in Pennsylvania, with an enrollment of 250,000 students. The consolidated movement, however, is closing them at the rate of 375 a year, so that, even at this rate, almost 25 years will be required to close all the one-room schools of Pennsylvania, and it is probable that unfavorable geographical conditions will make it impossible to consolidate some of them.

Great advancement is being made in the establishment of centralized schools. The first consolidated schools established in Pennsylvania were at Linesville in Crawford County and at Russell in Warren County, both schools being organized in 1892. There were only 8 consolidated schools in the State in 1900, while by 1925 the number had increased to 450.

The agricultural vocational school movement has also made great progress. In 1913 there were no agricultural vocational schools in the State, while today there are 44 such schools besides 24 agricultural vocational departments in high schools. The

combined enrollment of boys studying agriculture and of girls studying home economics in these schools and departments exceeds 5,000.

RURAL CHURCHES

The rural church movement has not kept abreast of the times. In spite of this fact, it is not to be taken for granted that all of the country folks are going to the bow-wows. We should take into account that there are 20,000 less people living in the country today than there were in 1900. Furthermore, the automobile has made it possible for thousands of people to attend religious services in the towns and cities. Inasmuch as only 5 per cent. of our farmers have radio-receiving sets, this cannot be regarded as a factor in the decline of the rural church.

The whole church situation, both in the country and in the city, demands the most serious consideration, for the safety of our wonderful nation lies very largely in its religious thought and development.

Perhaps nothing will help the religious situation in rural districts more than a closer union between the town and country people, and better cooperation in church work and community welfare enterprises.

FARM HOMES

The average farm home in Pennsylvania is better than at any time in the history of the State. Some of our older people who were reared in very fine country homes may be disposed to doubt this statement. It is often said that love makes the home and a truer statement was never made. But more than love is needed to make the farm home or any other home all that it should be. In these days of comforts and conveniences, we believe that the farm home should be just as well equipped as the city home, provided the farmer is financially able to bear the expense.

Of the 200,000 farm homes in Pennsylvania, 29,014 are equipped with running water, 22,889 with bath rooms, and 39,538 with improved heating systems. As the farmers become more prosperous, we may confidently expect great progress in the installment of modern conveniences. Electricity may accomplish more for rural Pennsylvania than any of us now realize.

FOREWARD

Most of our remarks have related to the past 25 years. We are convinced that our farmers and rural Pennsylvania have kept fully abreast of the times.

Who knows what the next 25 years will bring forth? Will the advancement be as great as during the first quarter of the century? Personally, I am optimistic. I believe that economic conditions for the farmer will continue to improve; that science will assist him more and more so that crop and livestock losses will be less and profits greater; that improved methods of marketing will continue to be developed; and that with increasing prosperity we will have a happier and more contented rural population, enjoying the highest and finest things the great Creator intended for the tillers of the soil who live in the midst of His beautiful handiwork.

PROBLEMS AND PROSPECTS FOR PENNSYLVANIA DAIRYMEN

R. W. BALDERSTON, *Secretary of the Interstate Milk Producers' Association and the Philadelphia Inter-State Dairy Council,*
Philadelphia, Pennsylvania

It is right that there should be a State Dairymen's Association in Pennsylvania at this time. There are situations to be met and problems to be solved of vital importance to all the various branches of dairy industry. These require united effort.

Over 12,000 members of the Inter-State Milk Producers' Association, perhaps an equal number of members of the Dairymen's League Cooperative Association, and 8,000 of the members of the Dairymen's Cooperative Sales Company live in Pennsylvania. These milk producers for whom I would speak a word tonight are the back-bone of our dairy industry.

I wonder if we all realize how fundamental to the progress of the whole dairy industry is the financial stability and well being of the rank and file of our dairy farmers. It is generally recognized by breed Association leaders that the best permanent market for pure bred stock is to improve the quality of the herds on the many dairy farms throughout the United States, to bring up the average production of our common cows and grades through the use of pure bred sires from high producing dams and to increase the number of pure breds in the hands of those who are dependent primarily on the sale of the product of their herds for a livelihood.

Without satisfied milk producers there would be no stabilized supply of 750,000 quarts of milk for large Philadelphia milk distributors to daily deliver to the consumers' doorsteps, and for the manufacturers of dairy products to convert into ice cream, soft cheese, and other specialized dairy products for our eastern markets. Without this great army of plain, ordinary dairy farmers there would be no need for by-products, concentrated feeds, and no need for machinery and equipment for dairy barns and manufacturing plants.

With standardization of quality, with improved facilities for transporting and handling milk, and increased demand for

dairy products, the marketing situation through the state of Pennsylvania has become much more uniform. Due to increasing labor and other costs, many farmers in the former intensive milk shipping counties have decreased their herds while the added inducements of shipping milk have somewhat increased the size of herds in the outlying counties.

A generation ago there were certain sections of Pennsylvania around the large cities where the dairy industry was not only the chief means of livelihood on a large majority of the farms, but in many cases, was practically the chief source of farm revenue. These were the sections supplying our great cities with fluid milk and were located close in to the cities because of the necessity of having the milk received and distributed very promptly to prevent its souring before being used.

Those sections of the state further back from the cities were dependent on farm-made butter or local butter and cheese factories as a means of marketing dairy products. The dairy was apt to be not even a major project with all farmers in these last mentioned sections. Often times it was conducted by the women folks just as was the poultry flock, as an adjunct to the main business of general grain and animal husbandry farming.

There are evidences that a new economic movement among our dairy farmers of Pennsylvania is now in its early stages. With the wider use of improved methods along all agricultural lines, farming is being specialized in several directions. Fruit, potato and poultry husbandry are in the forefront of this movement. Dairying has lagged somewhat behind, but there are indications that the movement is now under way in the dairy industry to a greater extent than we have realized.

Some of these are as follows:—

I. Increasing interest in and demand for tuberculosis eradication, particularly on the so called "area plan", this demand coming both from the producers of pure bred and grade stock and also on the part of the health authorities of many of our consuming centers. There are several economic factors involved in this tuberculosis eradication movement.

In the first place an accredited herd owner is almost compelled to begin to think about raising his own young stock to replenish his herd and when he comes to this point, he begins to think in terms of pure breds, at least purebred sires. In the second place, where a large city introduces the tuberculin test as a requirement for the production and sale of milk for that market, there is at once a decided movement toward specialization. These farmers who have taken the trouble to clean up their herds

on the accredited plan feel that they are justified in increasing their herds and those farmers with only a few cows sell out rather than take the trouble of maintaining a herd free from tuberculosis. Thus there is apparently a probably slight trend movement back to larger average herds in our milk shipping counties.

II. The increasing interest in and demand for milk of better quality from the standpoint of sanitation is already giving permanency to our industry. It is not worth while for a landlord or land owner to equip his farm for milk production unless it is expected that there will be sufficient importance attached to the dairy to make milk production worth while. We find that where farmers, through the quality control work of the Dairy Council or regulations of our cities, have to meet certain minimum requirements as to stables, milk houses, facilities for cooling, etc., that dairymen with larger herds have found the cost per cow much less than that of the marginal dairyman who at times has but a few cows in the herd.

III. As a result of these two movements, both of which have for their object not only the safety of the public health but also the economic advantage of the farmer through improved markets and reduction of losses, the farmer's attention has been called to other questions connected with the success of his dairy herd management. The silo, alfalfa, better feeding, and better bookkeeping have all received a decided impetus. If a farmer has an accredited herd which he expects to use as a foundation from which to breed, he is far more concerned with the production per cow and the comparative efficiency of his cows as machines for the production of milk. If he is required to exercise greater care in producing his product and to better equip his farm plant, he is likewise more interested in more profitable methods of feeding and handling his herd.

IV. With the movement of dairying westward across the continent, the manufacture of cheese and butter has been more and more taken over by the newer dairy sections farthest from the centers of population. As dairy communities grew up and the intensity of the cow population increased throughout the middle west in such states as Iowa, Minnesota and Wisconsin, the high priced lands of these central states compelled the dairy farmer to select high producing animals and to use labor saving devices and practice economic feeding. But these western dairymen have not been satisfied with cutting production costs and having butter and cheese as markets for their products. They are coming into our eastern markets with cream and other products which bring the producer a higher net return and which,

they find, can be shipped here in successful competition with our eastern farmers, even with higher transportation costs. Care in production and handling, proper refrigeration in transit, bring these western products to our eastern markets in splendid condition.

Our eastern farmers are beginning to appreciate the importance of this new competition and the world-wide nature of our market for dairy products today, and are becoming more and more desirous of preparing themselves to meet these and all other competition through better production methods and higher standards for our products.

V. The increasing cost of transportation, particularly railroad transportation since 1914 has been responsible for many serious economic disturbances to agriculture and undoubtedly is even yet working some permanent economic changes. One of these changes has been to put the eastern farmer in a relatively better position with regard to marketing some of his products and on the other hand, put him at a distinct disadvantage in the purchase of by-product dairy feeds. This would seem to indicate that in the future a man who had a herd of highest net return per unit of feed and labor would have a greater advantage over his less ambitious or more poorly trained neighbor.

If these things be true, what does it signify? I am willing to venture a prediction that Pennsylvania milk producers are going to improve their conditions through their own united efforts. The result of government investigations in Chester County, Pa., some two or three years ago, and more recently in Newcastle County, Delaware, indicates clearly that our eastern dairy farmers have been using better producing acres than they have cows. In other words, they have been handling their farms as factories for the production of crops to better advantage than they have their cows for the conversion of those crops into milk. Through better breeding and feeding and record keeping, our dairy farmers, are going to make rapid strides to increasing the net returns per cow, in lengthening the average period which good cows remain of profit to the dairy, and lowering the cost of producing milk.

Dr. C. W. Larson, Chief of Bureau of Dairying of the United States Department of Agriculture, recently said that the increasing demand for dairy products in America can be met for many years to come without increasing the number of cows, if we will only get rid of our "boarders" and breed from our best blood lines in all of the chief dairy breeds.

The dairy program for Pennsylvania calls for the cooperation of our organizations and agencies that have for their pur-

pose, either directly or indirectly, the importance of the economic status of our Pennsylvania dairy farmer. The organizations of the bovine tuberculosis hearing before the Senate Committee of the last legislature was a splendid example of intelligent coordinated effort. The farmers within five years responded to the influence of the Philadelphia selling plan so as to practically remove from that market the great burden of seasonal surplus. The same group of farmers and co-operating dealers have voluntarily and practically unanimously placed themselves squarely behind the quality control regulations enforced by the Philadelphia Inter-State Dairy Council. The farmers and dealers in the Pittsburgh area have similarly established a sales plan to stabilize milk market conditions and have established a similar Department of Quality Control in the Dairy Council. The Dairymen's League, operating in the northeastern part of the State is actively supporting a program of quality improvement.

In Pennsylvania we have the world's best market at our door. On our farms grass and corn grow abundantly, we have a network of highway and railway transportation facilities, three requisites for satisfactory dairy production. We have a sturdy, intelligent industrious group of farmer folk on our Pennsylvania dairy farms that can be depended upon, to increasingly apply the very best methods of farm and dairy management, we have represented here tonight besides these farmers themselves, those groups and agencies which have been and I feel confident will continue to be most helpful in making Pennsylvania in every way the greatest dairy state in our Union.

THE CHANGING ORDER

F. P. WILLITS, *Secretary of Agriculture*, Harrisburg, Pa.

When I was a young man, I was in a retail general store. In those days, we delivered groceries around the neighborhood to farms and bought eggs and butter. Butter was selling for 15 to 20 cents a pound and of course, it was made on practically every farm. Some times during the year, we were able to buy very little butter and at other times a great deal. I mention these things just to show a condition that existed throughout Pennsylvania 40 to 50 years ago and to contrast with it the changes that have come about since that time to the advantage of everybody concerned.

After serving in the retail business, I went to my present farm in Delaware County. There I found this situation: Milk was being sold to creameries and farmers were paid the 15th of the following month. They did not know what they would get for their milk until the check arrived. I tolerated this kind of business many years but it irritated me all the while. Many of the farmers in the community were also becoming dissatisfied with the treatment received. It was this situation existing in the Philadelphia district that led to the organization of the Interstate Milk Producers' Association and to other associations in other districts. We did not organize merely to get an increased price for our product, but also to establish better business practices and to know what we would get for our milk when we delivered it.

In this brief review of a changing condition, during the past 50 years, it is readily apparent that dairymen have their work on a better business basis than ever before. Business principles have been applied, quality of the product has been increased through cleaning up stables and reducing the bacterial count, the supply has been more evenly distributed over the year and as a result the producer, the dealer, and the public have benefited in common.

Let me remind you of the prominence of Pennsylvania as a dairy State. According to the 1925 Federal census, there were 861,013 dairy cows in the State two years old or over, making Pennsylvania rank fourth among the States. In 1924, it is estimated that there were 412,100,000 gallons of milk produced

on the farms of Pennsylvania. In addition, butter was made on farms to the extent of 31,300,000 pounds.

These figures indicate very clearly not only that Pennsylvania is a leading dairy State, but that dairying is one of the most important enterprises on the farms within the State. It can very properly be asked, what is our Department of Agriculture doing for this great industry, and in this connection, I want to refer briefly to what has been accomplished in the eradication of bovine tuberculosis during the past year.

The eradication of bovine tuberculosis in Pennsylvania made rapid progress during 1925 due to the greatly increased appropriation for indemnity purposes. A total of 221,000 cattle were tested under the individual and area plan during 1924, while in 1925 the number was 384,046. With the demand, the personnel and the indemnity money available during 1926, approximately half a million cattle will be given the test.

The herds in six counties—Mercer, Crawford, Jefferson, McKean, Butler and Lawrence, have been completely tested. In the first three of these counties, which are called "modified accredited counties", the disease has been reduced to less than one-half of one per cent.

A total of 230 townships in 34 counties are qualified and are awaiting the test under the area and individual plans. These areas include approximately 230,000 cattle.

In connection with the future of tuberculosis prevention and eradication work in Pennsylvania, assuming that the State Department of Agriculture will receive at least the same amount of money for indemnity purposes for the next four fiscal periods that has been made available during the present fiscal period, the disease will be reduced to less than one-half of one per cent. by 1933.

Another development worthy of mention at this time is the new milk testing law which recently became effective, replacing an old law. This act requires all milk and cream receiving stations to hold a permit and requiring persons testing and weighing and sampling milk for the Babcock test to hold licenses. This act is a step forward in the protection of the milk producers in receiving correct payments for the milk and cream which they produce because it specifically requires that where purchases and settlements are made on the basis of the Babcock test, not only are the receiving stations required to have a permit but the persons making the tests and sampling and weighing are now required by law to be proficient in this service and obtain a license. In addition to this the results of Babcock tests are required to be

sent to the producers or posted in the receiving stations so that they will know before hand how much money they will receive in payment for their product. This Act further provides that composite samples of milk be kept in proper form for checking purposes where any controversy arises over the first tests made. Penalties are provided for fraudulently reading tests and prosecutions have already been instituted where the tests were fraudulently reported and producers cheated.

I mention these things to call to your mind the new era in which many dairymen of today find themselves. It is not a time of hap-hazard business methods and one-sided bargaining but an order in which dairymen are applying business principles to dairy production and are having more to say about the marketing of their produce.

TAKING THE BLUE SKY OUT OF DAIRY RECORDS

C. L. BURLINGHAM, *Assistant General Manager of the Breeders' Gazette*, Chicago, Illinois

I trust you will deem it profitable to consider tonight the heritage handed down to present day dairy farmers in the several pure breeds of dairy cattle and whether this heritage cannot be used to larger advantage than is true at this time. To my way of thinking no greater boon could be afforded the breeding industry than an awakening on the part of owners of cattle generally to the real meaning of the words, "pure bred" and to the obligation which rests on every owner of registered animals. There is grave need that the full significance of pedigree be realized. Not until certificates of registry are given more value than they carry now will the cause of the purebred progress as it deserves.

The purebred dairy cattle of Pennsylvania are in fact much more than factories of milk and fat. To measure their worth it is necessary to think in broader terms than are expressed in their yield at the pail. To gain a full conception of what these animals represent and what they may be made to mean in the future of the State is to become profoundly impressed with their wonderful qualities, deeply grateful to the generations of men whose life work developed these qualities, and strongly imbued with a determination to preserve and improve upon these qualities.

For the pure bred dairy animal is not a thing quickly brought to its present perfections. For hundreds of years men have bent their efforts continuously to a preservation and a constant improvement of desirable characteristics. The dairy cow arrived to her present form only through meticulous study and concentration for very many generations of cattle and men. There is definite, well-founded reason for every point in the conformation requirements of the approaches to true type and ideal type in all the breeds. The long, wide level rump is not the pelvic formation of the wild cow from which present breeds are descended. Only by long attention in selection have this and other present form requirements been attained. All the skill of leading stockmen—the master breeders of several counties through centuries—has been expended that the farmers of today might have better animals than were ever before available.

In the new born calf, therefore, is bound up a wealth of human experiences which makes it more than 15 pounds of veal or a future progenitor of producers or a producer itself. If it is a Black and White it can trace its lineage full two thousand years. As the three wise men of the east journeyed to Bethlehem black and white herds of dairy cows were being guarded through the night in western Europe. Possibly a thousand years before that the ancestors of the Brown Swiss grazed the Alpine slopes. Later on the Islands of Jersey and Guernsey, possibly 900 years ago, a careful program of selection and improvement began which made possible the later famous breeds of those historic small dots of land. Peculiarly, the infant of the breeds, the Ayrshire, is the one whose antecedents are least known. However, enough is recorded and handed down through tradition that it may safely be said that every owner of a Red and White is indebted for the perfections it displays to many years of canny, frugal, farseeing Scotch live stock talent. Think of the planning, the sacrifice, the groups about the family hearth who have given so freely that these 1926 herds might be possible. In the light of the contributions of these hundreds of years how far short we fall in fully appreciating the heritage which is ours. How inadequately money really measures the value of these pure bred! If we could take even the record price paid for a breeding animal and pile it dollar on dollar and beside it picture the human experiences which have gone into the development of the animal for a hundred years, how small that pile of dollars would be proved to be!

It is worth while to examine into the progress which is being made in America. How wisely have we used the lines of pure breeding handed on to us? It is now nearly 100 years since these were first imported to this country. Can it be said of us that we have contributed largely to the further improvement of these breeds? How many men do you know who, resolved to breed better cattle, have consistently studied their animals enough to have an intelligent program of breeding settled upon. It is a sad commentary on the American dairy cattle owner that so few men should thus far have proved themselves deserving of the title of breeder in the largest meaning of the word. A relatively small number have from time to time stood out in the limelight temporarily but the men whose work stands the test of time, who have been truly constructive can be counted on the fingers.

This country has brought forward experts in feeding. The individual record performances are phenomenal. No place else in the world are they closely approached. There are herd mana-

gers here whose skill cannot be equaled. But when it comes to breeding better cattle, we have no cause for pride in results.

To correct this situation requires patience and perseverance. A year's work or a single generation in a herd is no criterion. Breeding is a lifetime undertaking. But it is thoroughly worthwhile. What greater thing can a man do agriculturally than produce a family of cattle more efficient, more productive than any which have ever before served mankind! There is very great need that effort be at once directed toward improvement.

Thus far no herd of dairy cattle has been brought to so high a plane that all the off-spring are of meritorious quality. There are bound to be some culls—throw backs to the inferior qualities of their ancestors. Yet few indeed are the herds which are closely culled with each generation. No breed of cattle is yet so uniformly superior that it is free from low quality individuals. Yet the registry books are open to all off-spring of registered parents regardless of whether they are of desirable individuality or not. No registry association in America has thus far imposed any qualitative restrictions except that of color. As a consequence very many registered animals are unworthy of the certificates of pure breeding they carry. As a consequence many a registered herd finds itself unable to compete with grade herds in cow testing associations. As a consequence high quality grades outsell the average registered animal.

Dairy cattle breeders enjoy an advantage over the owners of any other class of live stock. Dr. S. M. Babcock made it possible for every herd owner to make an absolute check on his progress with each generation. The pity is that wider, more intelligent use has not been made of the Babcock test in herd improvement. The cow testing association has done more actual, effective work in the right direction than any other agency. Yet its facilities are being abused and it is failing to reach the herds from which comes much of the breeding seed stock of the country. It lacks the protection and authentication its records need to make them appeal to the owner of pure bred.

On the other hand the official and semi-official tests have failed to accomplish the results sought. In the hands of those developing top families and where it is of first importance to establish maximum records they have been valuable. Properly used they may continue to serve a good purpose with a relatively small number of herds. In the average breeding herds of the county, however, these tests are not productive of necessary facts. They have been seriously misused and an absolutely untenable situation has come about in that, (1) Too few cows in a herd are

tested, (2) All attention is directed to the best individuals, the inferior ones having no records whatever, (3) Unwise systems of feeding and management lessening breeding value of cows tested are encouraged, and (4) The whole plan is unnatural and uneconomic when applied to practical breeding herds.

Now, no new record idea is going to revolutionize dairy cattle breeding in this country. A fundamental change in attitude must precede any great improvement. But it will be a long step in advance if a sensible, practical application of the Babcock test can be made periodically to a greatly increased number of herds. Such a plan is actually in operation now. By common consent the several dairy record societies have left to the Ayrshire Breeders' Association the task of experimenting to work out rules which will be generally applicable in what is known as the Herd Test. It is designed (1) to furnish a record on every cow in the herd thereby leading to a culling of tail enders as well as giving prominence to the toppers in the herd, (2) to lead to rational feeding of the whole herds, feed costs being recorded, (3) to provide breeding information through testing many daughters of a bull rather than a few, (4) to establish surprise check tests for authentication, (5) to reduce costs to a point where the test can be given general application and (6) to put the whole question of testing in a more effective relation to that of greatest importance to the future of dairy farming in America—the breeding of better cattle.

Gentlemen, I recommend your careful consideration of this matter, not as an end in itself, but as a means to a most desired end.

THE FARMER AND THE STATE

GIFFORD PINCHOT, *Governor of Pennsylvania*

The order of the Public Service Commission defining the duty of electric companies to extend their lines in rural areas is the first step toward securing electric service for the farms of Pennsylvania. Rumors that the companies will contest the order in the courts only emphasize the necessity for such fundamental amendments of the Public Service Company Law as are proposed by some of the Giant Power bills introduced by Senator Steele. They give additional force to the arguments for authorizing the creation of organizations of farmers to purchase current at wholesale and assume the cost of distribution themselves, also provided for in these bills.

The order of the Commission defines the obligations of electric companies to serve the rural areas in their chartered territory either by wholesale delivery of current to farmers' mutual associations (who will distribute it without profit), or by building company lines to serve these areas by retail delivery of current direct to consumers. Notwithstanding the scramble for charters that has gone on in the last few years (until very little territory remains that is not covered by paper right), the evidence in the hearings before the Commission, *put in by the companies themselves*, showed that less than 6,000 of the farms in the State were served by the companies. This is less than three per cent. of the 200,000 farms in Pennsylvania. These 6,000 were served only as an incident to the service of certain preferred classes.

The companies contended that there are so few genuinely rural lines in the State that experience here is no guide whatever as to how the new order will work out in practice.

Such a confession of neglect of public duty is convincing proof of the failure of company initiative, and of the necessity for taking such public initiative as has been taken by this order. If further proof is needed we have it in the fact that the companies resisted the issuance of this order for eighteen months. Further resistance in the courts, such as is rumored in the newspapers, will only strengthen the proof. If successful, it would demonstrate the inadequacy of present provisions for regulation in the public interest, and make more clear than ever the necessity

for such a thoroughgoing reform of the Public Service Company Law as is proposed by some of the Giant Power bills.

"There is no intention of defrauding the companies of their just earnings. They may properly demand of the courts one thing, the guaranty of a reasonable opportunity for a fair return on the money they have actually invested. That the Giant Power bills give them, and to that they should be limited. At the regular session of the Legislature, they defeated the proposed amendments. At the close of the hearings before the Public Service Commission, I am told, their counsel practically defied the Commission to compel them to do anything that they did not choose to do.

"Claiming that the cost of distribution is the reason for the present exactions from farmers and refusing to bear that cost themselves, they also defeated last year the two bills which would have authorized the farmers to assume these costs, buy current wholesale from the companies, and distribute it themselves. I do not believe that the farmers of Pennsylvania, or the city dwellers either, will submit to such dog-in-the-manger tyranny.

"Abundant and cheap electricity for the farms of the State was one of the great eight objectives set up by the Giant Power Survey and among the most important for the general social welfare. The farmers of Pennsylvania are indebted to the vision and persistence of Morris L. Cooke, Director of the Survey, for this first step toward the realization of this objective. They are also indebted to Otto M. Rau and George H. Morse (who did distinguished work in this phase of the survey by proving the advantages and practicability of increased use of electric power on Pennsylvania farms and who prepared the order of the Public Service Commission) and to the State Council of Farm Organizations and their attorney, Mr. Vincent D. Nicholson, whose cooperation in presentation of evidence and in argument was essential to the successful outcome.

The order alone is not enough.

The farmer must do his share by realizing that to get electricity cheap he must use more than the city man. This he can profitably do. Aside from domestic needs, there are advantageous uses too numerous to mention for electric power in farm operations in the dairy, orchard, barn, and field.

On their side, the companies have not realized the possibility of developing use of power on farms, given adequate facilities and proper rates. They should heed the advice of President Ferguson, of the Hartford Electric Light Company, that the way to induce the farmers to use current largely is to sell it cheap.

DAIRYMEN OF PENNSYLVANIA

With Herds of Five

Cows or More

Attaining Special Merit During 1925

in Cow Testing Association

Work

Following is a complete list of all herds of five or more cows averaging more than 400 lbs. of butterfat for the year.

Owner	Address	Av. no. of cows	Breed	Lbs. milk	Lbs. B'fat	County
Lewis A. Zimmerman	Leighton, Pa., No. 1	20.00	R. & G. H.	15958	519.6	Carbon
Wallace Zimmheller	Leighton, Pa.	7.83	R. H.	13645	476.0	Carbon
Alex Martin	Valencia, Pa.	15.00	R. & G. H. -G. J.	11262	442.1	Butler
J. B. Elder	Volant, Pa.	5.67	R. H.	12467	438.6	Lawrence
C. A. Fox	Pocopson, Pa.	24.67	R. & G. J.	7754	431.7	Chester
George Kennedy	Utica, Pa.	12.83	R. & G. J.	8891	431.0	Venango
Elmer Gray	Leighton, Pa.	20.00	R. & G. H.	11730	429.8	Carbon
O. D. Smith	Meadville, Pa.	8.67	R. H.	11647	429.1	Crawford
Ivo V. Otto	Calisle, Pa.	21.67	R. H.	12523	423.3	Cumberland
Geo. Gehman	Coopersbury, Pa.	10.17	G. H.	11511	421.3	Lehigh
P. C. Gible	Mechanicsburg, Pa.	8.00	R. H.	12249	420.4	Cumberland
W. W. Ferguson	Thompsonstown, Pa.	5.75	G. H.	9788	418.5	Juniata
Orville Rumbaugh	Millerstown, Pa.	8.42	P. & G. H.	11602	413.0	Perry
E. R. Shugart	Calisle, Pa.	7.00	R. & G. H.	11235	410.8	Cumberland
John Prestor	Grover, Pa.	5.50	G. H. & G. J.	9245	407.8	Bradford
H. A. Freed	Racine, Pa.	5.25	R. & G. H.	11812	407.1	Lawrence
C. M. Worley	Mercer, Pa.	8.50	R. G.	7784	405.9	Mercer
C. C. Stoyer	Greenville, Pa.	9.50	G. G.	7440	400.9	Mercer

Following is a list of all the herds of five or more cows averaging from 350 to 400 lbs. of butterfat

J. H. Brinton	Gap, Pa.	13.42	R. & G. G.	8566	397.5	Lancaster
Walter Neeley	Emlenton, Pa.	7.00	R. H. & G. G.	11248	397.3	Clarion
A. N. Lehman	Carlisle, Pa.	10.67	R. & G. H.	11120	394.2	Cumberland
H. G. Williams	Canton, Pa.	12.75	R. & G. H.	10799	393.1	Bradford
J. W. Seiber	McAllisterville	8.33	G. H.	11075	392.5	Juniata

Owner	Address	Av. no. of cows	Breed	Lbs. milk	Lbs. B'fat	County
L. W. Veit	Erie, Pa., R. D. 3	15.92	R. H.	10906	392.5	Erie
Adam Schultz	Hereford, Pa.	14.92	G. H.	7405	391.2	Lehigh
C. I. Degen and Son	Mifflintown, Pa.	8.42	R. & G. H.	11537	386.6	Juniata
J. B. Byler	Allensville, Pa.	8.00	R. & G. H.	12049	385.9	Mifflin
St. Vincents Archabby	Beatty, Pa.	34.17	R. & G. H.	1112	384.3	Westmoreland
A. F. Hartman	New Bethlehem, Pa.	5.92	R. & G. G.	7004	382.0	Clarion
W. H. Crawford	Mercer, Pa.	21.75	R. H. & G. G.	9742	381.3	Mercer
D. Q. Adams	Mifflintown, Pa.	11.00	R. & G. H.	10061	379.9	Juniata
Harrington & Co.	Dunshore, Pa.	9.17	R. H.	11348	379.7	Sullivan
Hugh Oskerman	Milton, Pa.	12.33	R. & G. J.	7360	379.7	Bradford
R. G. McMurry	Utica, Pa.	15.17	R. & G. G. & J.	7548	379.0	Venango
G. L. Snyder	Carlisle, Pa.	7.00	R. H.	11006	378.7	Cumberland
W. A. Crammer	Monroeton, Pa.	6.42	G. G. & J. H.	8979	378.2	Bradford
T. R. Auker	Mifflintown, Pa.	10.75	R. & G. H.	10818	378.0	Juniata
Soloman Peachy	Allensville, Pa.	10.75	R. & G. H.	10967	377.6	Mifflin
Mrs. C. M. Schwab	Loretta, Pa.	14.08	R. G.	7504	376.7	Cambria
W. W. Vandivort	Evans City, Pa.	6.42	R. G.	7269	375.9	Butler
A. M. Bell	Salina, Pa.	8.33	R. & G. H.	9765	375.4	Westmoreland
W. W. Peffer	Carlisle, Pa.	9.67	R. & G. H.	10926	374.8	Cumberland
C. V. Driscoll	Dunshore, Pa.	8.33	R. & G. H.	9593	372.7	Sullivan
C. A. Wright & Son	Canton, Pa.	19.92	R. & G. G.	7666	372.6	Bradford
Milo Moose	Volant, Pa.	8.50	R. J.	6161	372.6	Lawrence
Mast Stoltzfus	Morgantown, Pa.	21.58	P. & G. H.	10739	372.5	Lancaster
Chas. Barker	Ulysses, Pa.	9.17	R. A. & G. H.	8826	372.2	Potter
H. I. Gray	Honey Grove, Pa.	13.00	R. & G. H.	10135	371.6	Juniata
Walter Hack	Berwick, Pa.	17.17	R. G. -R. H. & G. G.	8328	371.1	Columbia
J. E. Shook	Silgo, Pa., R. D.	6.58	R. & G. G.	8548	370.5	Clarion
J. W. Bronson	New Galilee, Pa.	13.00	R. J.	6944	369.7	Lawrence
H. W. Boozell	Volant, Pa.	14.36	R. & G. J. & G. H.	8896	367.5	Lawrence
J. A. Patterson	Rohrsburg, Pa.	9.00	R. & G. H.	8995	366.7	Columbia

Owner	Address	Av. no. of cows	Breed	Lbs. milk	Lbs. B'fat	County
Ira M. Eby	Leman Place, Pa.	16.50	R. & G. H. H. & G.	10935	366.1	Lancaster
J. S. Richey	Everett, Pa.	10.42	R. & G. J. H. & G.	7214	365.9	Bedford
Mrs. R. H. Curtze	Erie, Pa., R. D. 8	24.08	G. J.	9979	365.0	Erie
Mercer Sanitorium	Mercer, Pa.	14.92	R. J.	6778	363.8	Mercer
J. C. Spenser	Canton, Pa.	16.00	R. & G. H.	10013	363.6	Bradford
W. H. & W. F. Book	Portersville, Pa.	11.00	R. & G. J.	6965	363.5	Butler
E. J. Harshberger	Mattawanna, Pa.	12.00	R. J.	6464	363.3	Mifflin
J. M. Eby	Gordonville, Pa.	12.33	R. & G. H.	10863	363.1	Lancaster
R. L. Shaffer	Allentown, Pa.	21.00	R. & G. H. & J.	10960	362.0	Lehigh
R. Bamford & Son	Midway, Pa.	24.58	R. J.	6994	361.7	Allegheny
Burl Hayes	Edinboro, Pa.	13.00	R. & G. H.	9510	361.4	Erie
John Moffat	New Alexandria, Pa.	9.17	G. H. R. & G. G.	8266	360.4	Westmoreland
F. W. Gorham	Wysox, Pa.	17.08	R. H. R. & G. J.	9984	359.7	Bradford
W. Lee Cowden	McDonald, Pa. 3	15.83	R. H. & G. J.	10079	358.7	Washington
A. W. Mawhinny	Canonsburg, Pa.	8.00	P. & R. H.	11382	357.6	Washington
S. S. Hamilton	Salina, Pa.	8.08	R. & G. H.	10065	357.6	Westmoreland
W. A. Withers	Elizabethtown, Pa.	21.17	R. H.	9671	357.4	Lancaster
F. I. Shirey	Beatty, Pa.	15.42	R. & G. H.	9915	357.2	Westmoreland
Chas. French & Son	Milan, Pa.	8.67	R. & G. -G. & J.	6403	357.2	Bradford
J. S. Campbell, Jr.	Butler, Pa.	31.00	R. J.	6841	356.8	Butler
River Ridge Farm	Franklin, Pa.	10.58	R. J.	6517	356.7	Venango
A. C. Yoder	Allensville, Pa.	10.33	R. & G. H.	11392	356.5	Mifflin
P. J. Cox	Warrors Mark, Pa.	12.83	P. & G. G.	6873	356.3	Blair
K. H. Lear	Carlisle, Pa.	14.00	R. H.	10261	356.1	Cumberland
John Doane	Powell, Pa.	22.33	R. G. & H. & G. J.	8828	354.8	Bradford
G. H. Wolf & Son	Snedekerville, Pa.	16.58	R. J.	6374	354.7	Bradford
C. W. Scott	Oakdale, Pa.	10.83	R. J.	9600	354.4	Allegheny
R. L. Carter & Sons	Hickory, Pa.	23.67	R. H.	10728	354.0	Washington
B. W. & J. C. Thompson	Clarion, Pa.	17.42	R. & G. H.	10643	353.9	Clarion
R. Rollengbacker	Greenville, Pa.	10.17	G. H. -J. & G.	8588	353.9	Mercer

Owner	Address	Av. No. of cows	Breed	Lbs. milk	Lbs. B'fat	County
M. L. Jones	Westtown, Pa.	94.33	R. & G. H.	10641	353.8	Chester
Burton McLean	Leighton, Pa. 1	14.83	R. H.	10551	353.2	Carbon
H. E. Long	Landisville, Pa.	13.25	G. J.	10206	353.2	Lancaster
W. A. Blumer	Fredora, Pa.	5.42	R. & G. H. & J.	7935	353.0	Mercer
P. A. Hugus	Latrobe, Pa., R. D. 3	24.00	R. & G. H. & J.	8595	352.5	Westmoreland
Paul Kochler	Hamburg, Pa.	11.25	R. & G. H.	12229	352.1	Berks
Galor Baron	Canton, Pa.	15.67	R. & G. H.	9180	351.4	Bradford
Albert Sarig	Bowers, Pa.	19.67	R. & G. H.	9380	350.1	Berks
John Parkes Jr.	Bridgeville, Pa.	10.17	R. & G. H. -G. & J.	9582	349.1	Washington
Edwin E. Zimmerman	Leighton, Pa.	15.92	R. H.	10585	348.9	Carbon
Carlyle Wooster	Leolyn, Pa.	14.08	G. G.	8022	348.8	Bradford
C. M. Berryhill	Hickory, Pa.	24.00	R. J.	6683	348.4	Washington
Thos. Cooper & Son	Euclid, Pa.	16.00	R. J.	6363	347.8	Mercer
Merle Onyley	Centerville, Pa.	9.08	R. & G. H.	10067	347.0	Crawford
George Sheperd	Canton, Pa.	8.08	R. & G. H.	9755	347.0	Bradford
Ursinus College	Collegeville, Pa.	13.00	R. & G. H. -G. G. & J.	9137	346.2	Montgomery
C. G. Niesley	Mechanicsburg, Pa.	12.92	R. & G. H.	9330	344.8	Cumberland
J. W. Raudabaugh	Carlisle, Pa.	16.17	R. & G. J. & H.	10292	343.8	Cumberland
Jonas W. Eberts	Andre, Pa.	22.83	R. & G. H. & G. G.	9763	343.8	Carbon
Adam Begel	Leighton, Pa.	7.00	R. H. & G. G.	10228	343.5	Carbon
J. H. Silvis & Sons	Greensburg, Pa.	63.25	R. & G. H. & J.	8911	343.1	Westmoreland
Allen Eshelman	Everett, Pa.	13.00	R. & G. J.	6629	342.8	Bedford
J. M. Marquis	Hickory, Pa.	10.92	G. G. J. & H.	8359	342.3	Washington
H. G. Von Wolftradt	Athens, Pa.	15.83	R. J.	6211	342.1	Bradford
M. M. Bushong	Columbia, Pa.	17.42	R. & G. G.	7619	342.0	Lancaster
Black Bros.	Millerstown, Pa.	6.25	P. & G. H.	9839	341.9	Perry
G. E. Wilson	Boiling Springs, Pa.	8.75	R. H.	10115	340.7	Cumberland
D. A. Morrow	Tyrone, Pa.	7.42	R. G.	6931	340.7	Blair

Following is a complete list of all herds of 5 or more cows averaging from 300 to 350 lbs. butterfat.

Owner	Address	Av. no. of cows	Breed	milk Lbs.	B'fat Lbs.	County
Smith Henry & Son	Wesleyville, Pa.	13.67	G. H.	9080	340.3	Erie
R. F. Devine	Wesleyville, Pa.	5.67	R. J.	5944	340.3	Erie
R. K. Rothenberger	Lansdale, Pa.	19.33	R. H.	9614	339.5	Montgomery
C. McClelland	Edinbury, Pa.	11.00	R. & G. -J. -G. & H.	8809	339.5	Lawrence
J. C. Flemming	Granville Summit	9.92	R. & G. H.	6993	339.2	Bradford
Harry Clark	Breezewood, Pa.	10.42	R. & G. H. G. & J.	6771	339.2	Bedford
L. Buck	Ulysses, Pa.	20.33	R. H.	9606	338.4	Potter
Guy Rhoads	Emlenton, Pa.	5.58	R. & G. H.	8197	337.8	Clarion
D. G. Grace	Grove City, Pa.	6.83	R. & G. J. & G.	6323	337.6	Mercer
A. N. McClinton	Coraopolis, Pa.	13.33	R. & G. H. -G. J.	9071	337.4	Allegheny
C. S. & F. M. Chaffee	Ulster, Pa.	18.55	R. A. -R. & G. H.	9350	336.9	Bradford
O. S. Gerhard	Palm, Pa.	14.67	R. G. H.	9458	336.0	Montgomery
W. G. Montgomery	Grove City, Pa.	8.75	R. G. H.	9732	335.8	Mercer
David Stoltzfus	Elverson, Pa.	15.08	G. G.	6843	335.7	Chester
Peck Bros.	Nittany, Pa.	6.17	R. H.	9624	334.9	Centre
H. B. Shibley	Landisburg, Pa.	8.00	P. & G. H. & G.	9561	334.8	Perry
J. B. Comstock	Mercer, Pa.	5.00	R. J.	6433	334.5	Mercer
Joe Hummer	Titusville, Pa.	14.17	R. & G. J.	6569	344.2	Crawford
Theorus Kauffman	Mifflintown, Pa.	12.92	R. & G. H.	10470	334.0	Juniata
C. E. Koontz & Son	Lutsville, Pa.	16.00	R. & G. J.	6144	334.0	Bedford
Will Hasbrook	Titusville, Pa.	9.08	G. H.	10465	333.9	Crawford
Arthur McCauldy	New Bethlehem, Pa.	5.58	R. H.	8902	333.7	Clarion
Chas. Mathers	West Chester	16.42	R. & G. H. G. & J.	7351	333.1	Chester
B. D. Hitchcock	Sugar Grove, Pa.	13.17	R. & G. G.	6930	333.0	Warren
Chas. Mertus	Fairview, Pa.	12.42	R. & G. J.	6556	332.7	Erie
V. H. Vones	Jamestown, Pa.	10.45	R. & G. H.	8603	332.5	Bradford
M. D. Lewis	Mount Joy, Pa.	11.67	R. & G. G.	9166	332.2	Mercer
C. H. Herr	Pottstown, Pa.	5.00	R. & G. G.	10501	332.0	Lancaster
Norris Matthews	Mechanicsburg, Pa.	10.08	G. H.	8010	331.6	Chester
Walter Rupp		9.00		9832	331.5	Cumberland

Owner	Address	Av. No. of cows	Breed	Lbs. milk	Lbs. B'fat	County
R. J. McCoy	Emlenton, Pa.	8.50	R. & G. J.	6738	331.0	Venango
O. O. Sell	Kutztown, Pa.	12.17	G. H.	9286	330.6	Berks
W. E. Richert	Greenville, Pa.	9.83	R. H. -G. H. & J.	7308	330.5	Mercer
James Caldwell	Cambridge Springs, Pa.	5.00	R. & G. J.	9230	330.3	Crawford
F. E. McEwen	Mercer, Pa.	8.00	R. & G. J.	6742	330.2	Mercer
E. K. Loyd	Elverson, Pa.	15.33	G. H.	7799	329.7	Chester
J. A. Kepple	New Alexandria, Pa.	20.58	R. & G. H.	8240	329.6	Westmoreland
Wm. Merts	Lyons, Pa.	9.50	R. H.	9513	329.3	Berks
Harry Seeley	Knoxville, Pa.	12.75	R. & G. H.	8698	329.2	Tioga
W. McAfee	Glen Moore, Pa.	16.70	G. H.	8942	328.4	Chester
R. L. Thompson	New Wilmington, Pa.	10.33	R. & G. J. H. & G.	6641	328.4	Lawrence
Elmer Dolin	Mifflin, Pa.	8.00	G. H.	10294	327.9	Juniata
Wm. Loyd	Downingtown, Pa.	23.25	R. & G. H. & G. G.	8004	326.9.	Chester
J. C. Flemming	Belleville, Pa.	10.17	R. & G. H. & G. G.	9585	326.8	Mifflin
H. B. Edeburn	Mercer, Pa.	9.17	R. G.	6412	326.5	Mercer
E. C. Ludt	Carlisle, Pa.	10.00	R. & G. H.	10111	326.4	Cumberland
Lloyd H. Hiehl	Lutzville, Pa.	17.67	R. & G. J.	6451	326.2	Bedford
T. C. Kryder	Mill Hall, Pa.	12.25	R. H.	10200	325.8	Centre
H. W. Dubbs	New Galilee, Pa.	5.00	R. H.	9400	325.7	Lawrence
C. F. Lederer	Potersville, Pa.	9.67	R. & G. J.	6745	325.3	Butler
J. W. Kerns	Lewistown, Pa.	13.00	R. & G. H. -G. G.	9048	325.2	Mifflin
O. H. Culbertson	Knox, Pa.	14.67	R. & G. G.	6689	325.0	Clarion
Pew Estate	Mercer, Pa.	12.00	R. & G. G.	6491	325.0	Mercer
Edward Bahl	Overton, Pa.	7.25	G. H. -G. J.	7605	324.9	Sullivan
Harvey H. Baum	Hilltown, Pa.	8.33	P. H.	10208	324.6	Bucks
Chas. McKinney	Franklin, Pa.	11.92	G. J.	7943	323.8	Venango
V. B. Billings	Edinboro, Pa.	7.25	G. J. -R. & G. H.	8155	323.7	Erie
F. L. Stahlman	New Bethlehem, Pa.	7.67	R. & G. G.	6609	323.6	Clarion
Peters Bros.	Port Matilda, Pa.	8.33	R. H. & G. G.	8428	323.5	Centre
H. F. Freed	Racine, Pa.	5.00	R. H.	9894	323.4	Lawrence

Owner	Address	Av. no. of cows	Breed	Lbs. milk	Lbs. B'fat	County
Homer Wetz	Quakertown, Pa.	10.83	G. J. & H.	9119	323.2	Lehigh
Clair Marsh	McKean, Pa.	9.67	G. H. -R. & G. J.	6392	323.1	Erie
Howard Baxter	Granville Summit, Pa.	8.33	R. G.	7661	323.0	Bradford
A. M. King	Mercer, Pa.	18.33	R. & G. J.	6439	323.0	Bradford
I. P. Chaffee	Hornbrook, Pa.	15.17	G. H. -R. & G. J.	6242	323.0	Mercer
John Taylor & Son	Cogan House, Pa.	9.83		10136	322.8	Lycoming
R. M. Clark	Centerville, Pa.	7.58	G. G. H. & J.	9074	322.8	Crawford
H. E. Cleland	Imperial, Pa.	17.25	G. G. & J.	7888	322.8	Allegheny
V. L. Schwab	Butler, Pa.	6.67	R. & G. G.	6631	322.5	Butler
E. I. McClelland	Edenburgh, Pa.	14.00	R. & G. J.	6393	322.2	Lawrence
J. M. Reno	Grove City, Pa.	16.08	R. H.	9326	322.0	Mercer
W. D. White	Grove City, Pa.	7.92	R. H.	9606	321.9	Mercer
Linfred Benner	Doylestown, Pa.	9.92	R. & G. H.	9527	321.9	Bucks
H. K. McCullough	Newville, Pa.	11.83	R. & G. G.	6590	321.8	Cumberland
John & Paul Wise	Harmony, Pa.	18.00	R. & G. H.	9694	321.7	Butler
J. Ard Cowden	Hickory, Pa.	18.33	R. H. & G. J.	9522	321.1	Washington
C. W. Ely	Bridgeville, Pa.	9.75	R. & G. H.	9689	320.9	Allegheny
E. W. Hummer	Titusville, Pa.	22.33	R. & G. G.	6270	320.7	Crawford
Samuel Black	Millerstown, Pa.	10.75	P. & G. H. -G. G.	8598	320.6	Perry
Hosia Wolfe	Columbia X Roads	13.55	R. & G. H. -G. J.	7761	320.6	Bradford
Aaron Metzler	Gordenville, Pa.	10.75	G. H.	9684	320.0	Lancaster
Frank J. Cooper	Slippery Rock, Pa.	16.00	R. J.	5980	319.4	Mercer
Grover Abby	Columbia X Roads	11.73	G. H.	9283	319.3	Bradford
C. R. Richard	Ridgeway, Pa.	19.08	G. H.	8787	319.0	Warren
M. H. Matthewson	McKean, Pa.	13.00	R. & G. H.	9527	318.5	Erie
S. W. Auster	Leolyn, Pa.	12.58	G. H. & G. G.	8026	318.2	Bradford
E. S. Cooper	Slippery Rock, Pa.	10.17	R. G. & G. G.	6471	317.8	Allegheny
McPherson Bros.	Sewickley, Pa.	16.58	R. A. & R. H.	8249	317.6	Mercer
C. E. Koontz	Lutzville, Pa.	10.17	R. & G. J.	5557	317.0	Bedford
Jno. H. Neuber	New Albany, Pa.	11.58	R. H. & G. H.	8481	316.9	Sullivan

Owner	Address	Av. no. of cows	Breed	Lbs. milk	Lbs. B'fat	County
N. B. Gable	Newport, Pa.	9.53	G. H. & G. G.	9963	316.7	Perry
J. W. Martin	Edinboro, Pa.	25.25	R. J.	6057	316.6	Lawrence
R. H. McLaughlin	McKean, Pa.	15.00	R. & G. H.	8952	316.4	Erie
G. D. Witmore	Warren, Pa.	44.33	G. H.	8386	316.4	Warren
D. E. Tracy	Troy, Pa.	16.17	R. & G. J.	5734	316.4	Bradford
John Tubbs	Knoxville, Pa.	14.75	R. & G. J.	8175	316.2	Tioga
L. B. Gerould	Milon, Pa.	6.00	R. H.	9091	316.0	Bradford
Herbert Wilcox	Canton, Pa.	17.25	G. H.	7155	316.0	Bradford
C. J. Koller	New Hope, Pa.	20.67	P. H.	9578	315.8	Bucks
J. M. Faner	Waterford, Pa.	28.17	R. & G. H.	9160	315.7	Erie
J. K. Adams	Berwick, Pa.	8.83	G. G. -H. & J.	5992	315.7	Columbia
R. H. King	Belleville, Pa.	8.83	R. H.	9437	315.9	Mifflin
Carl Wheeler	Meadville, Pa.	8.92	R. & G. H.	8939	315.2	Crawford
M. D. O'Hara	Saxonbury, Pa.	10.58	R. H.	8921	315.1	Butler
John F. Nace	McAllisterville	9.00	G. H.	9291	315.0	Juniata
Charles Kriebel	Doylestown, Pa.	11.08	P. A. & G. A.	7923	314.3	Bucks
Carl Stevens	Stillwater, Pa.	9.50	R. G.	6489	314.1	Columbia
Del. Co. Home	Lima, Pa.	18.17	P. H. & G.	8609	313.9	Chester
W. Griffith	Ebensburg, Pa.	22.08	G. S.	7038	313.4	Blair
W. S. Torbet	Newtown, Pa.	17.17	P. & G. G.	6669	313.4	Bucks
J. M. & C. A. Lemon	Saltsburg, Pa.	13.67	G. H.	8015	313.3	Westmoreland
L. Corzell	Malvern, Pa.	8.00	G. H.	8738	313.2	Chester
Wm. H. Landis	East Greenville, Pa.	16.33		8512	313.1	Montgomery
F. R. Glenn	Fenelon, Pa.	29.50	R. & G. J. & G. G.	6657	313.1	Butler
W. S. Bishop	Doylestown, Pa.	11.33	P. & G. A.	7233	312.6	Bucks
Paul Lahman	Carlisle, Pa.	8.83	R. & G. H.	9068	312.5	Cumberland
O. W. Stroughton & Son	Butler, Pa.	34.25	G. J.	5550	312.4	Butler
Homer Jack & Son	Stoneboro, Pa.	6.00	R. & G. H.	8427	312.2	Mercer
J. H. Bashore	Mechanicsburg, Pa.	10.33	R. & G. H.	9195	311.2	Cumberland
Nelson Yocum	Catawissa, Pa.	5.00	R. G.	6763	311.2	Columbia

Owner	Address	Av. no. of cows	Breed	Lbs. milk	Lbs. B'fat	County
L. W. May	Enon Valley, Pa.	9.25	G. -J. H. & G.	7368	311.0	Lawrence
G. P. McConnell & Son	Port Royal, Pa.	15.58	R. & G. H.	8919	310.9	Juniata
J. Earl Yerkes	Southampton, Pa.	10.50	G. S. J. & G.	7115	310.8	Bucks
W. T. Walker	Centerville, Pa.	8.58	G. H.	8548	310.7	Crawford
Masonic Home	Elizabethtown, Pa.	61.42	R. A.	8117	310.6	Lancaster
H. K. Martin	Goodville, Pa.	15.75	P. & G. H.	8996	310.5	Lancaster
J. S. Patton	Adamsville, Pa.	16.00	G. G. H. & J.	7443	310.5	Crawford
J. W. Zook	Belleville, Pa.	8.67	G. H. & G. G.	7531	310.4	Mifflin
H. B. & Gilbert Wilcox	Milon, Pa.	17.91	R. & G. J. -G. G. & H.	6366	310.4	Bradford
Hugh Ferguson	Slippery Rock, Pa.	23.47	G. G. H. & J.	6611	310.3	Mercer
H. Hillegas	Coopersburg, Pa.	9.33	R. H.	9602	309.8	Lehigh
J. A. Hinshaw	Washington, Pa.	16.75	R. J.	6508	309.7	Washington
R. H. Page	Paoli, Pa.	13.92	R. & G. G.	6318	309.7	Chester
A. Larson	Ridgeway, Pa.	12.42	R. & G. H.	7897	309.6	Warren
B. M. Dickenson	Coraopolis, Pa.	6.83	R. H. & G. J.	8740	309.5	Allegheny
J. A. Swanson	Ridgeway, Pa.	30.58	R. A. & Mixed	7756	309.2	Warren
Rouse Hospital	Youngsville, Pa.	37.42	R. & G. H.	9057	309.1	Warren
S. G. T. Hough	Washington, Pa.	13.67	R. & P. H. -G. G.	8407	308.8	Washington
Dellas Stahlman	New Bethlehem, Pa.	11.50	R. & G. G.	6779	308.8	Clarion
F. N. Fowler	Rimersburg, Pa.	6.00	R. & G. H.	7569	308.5	Clarion
George Bros.	Kinesville, Pa.	13.83	R. H.	9187	308.3	Berks
J. M. Shriver	Diamond, Pa.	13.75	R. & G. H. -G. G.	7284	308.3	Crawford
B. L. Frank	New Holland, Pa.	12.00	R. & G. H.	9816	308.0	Lancaster
B. R. Byler	Allensville, Pa.	7.25	Holstein	8319	307.9	Mifflin
G. G. Sauder	East Earl, Pa.	11.42	R. & G. H.	9140	307.6	Lancaster
C. H. Doan	Knoxville, Pa.	10.08	R. A. & G. H.	7962	307.5	Tioga
M. McFarland	Pulaski, Pa.	10.83	P. & G. H.	6430	307.0	Mercer
N. H. Bernheisel	Green Park, Pa.	12.42	R. J.	8608	306.8	Perry
George Hummer	Titusville, Pa.	10.33	R. & G. H.	5989	306.6	Crawford
S. E. Raudabaugh	Mechanicsburg, Pa.	9.42	R. & G. H.	9518	306.3	Cumberland

Owner	Address	Av. no. of cows	Breed	Lbs. milk	Lbs. B'fat	County
Harvey Murphy	Norristown, Pa.	16.58	R. & G. H.	8664	306.0	Montgomery
F. C. Shrimper	Erie, Pa.	19.58	R. & G. H.	8970	305.7	Erie
L. D. Weary	Carlisle, Pa.	9.33	R. & G. H.	9660	305.5	Cumberland
S. W. Zigler	Mechanicsburg, Pa.	12.17	R. & G. H.	8475	305.4	Cumberland
J. W. Berket	Tyrone, Pa.	12.50	P. & G. G.	5965	305.4	Blair
Miss Anne McCormick	Harrisburg, Pa.	9.83	R. & G. G.	6254	305.3	Cumberland
H. J. Gregory	Ridgeway, Pa.	19.83	R. J. & G. H.	7785	305.1	Warren
M. R. Miller	Canton, Pa.	17.92	R. & G. H.	7874	304.9	Bradford
Tressler's Or. Home	Loysville, Pa.	25.00	P. & G. H.	8404	304.7	Perry
McClelland Bros.	Canonsburg, Pa.	15.58	R. & G. H.	9750	304.0	Washington
C. W. Haywood	Ambler, Pa.	16.67	G. G.	6052	303.8	Montgomery
T. P. Racop	Cambridge Springs, Pa.	16.17	G. G.	7129	303.7	Crawford
Ray Trump	Orangeville, Pa.	10.42	R. & G. H.	8799	303.2	Columbia
N. H. Yoder	Spruce Hill, Pa.	9.33	R. H.	9642	302.9	Juniata
Clair Nichols	Meadville, Pa.	6.67	R. & G. H.	8919	302.7	Crawford
J. E. Miller	Rohrsburg, Pa.	9.33	R. & G. G.	5872	302.7	Columbia
Ziengenfus Bros.	Palmerton, Pa.	19.68	R. & G. H.	9083	302.5	Carbon
B. A. Sampsel	Bellefonte, Pa.	11.00	G. H.	7707	302.5	Centre
Dorsey Whitehead	Powell, Pa.	18.58	G. H. & G. G.	7496	302.1	Bradford
S. H. Markey	New Enterprise, Pa.	16.08	P. & G. G.	6522	302.1	Blair
Henry Kulp	Pottstown, Pa.	13.67	G. G.	7728	302.0	Montgomery
J. W. M. Gruber	Shippensburg, Pa.	13.25	R. & G. H.	6508	301.7	Clarion
W. H. McCullough	New Galilee, Pa.	8.00	G. H.	9397	301.2	Lawrence
Fay Dunn	Canton, Pa.	9.00	G. H.	6837	301.1	Bradford
E. P. Allison	West Chester, Pa.	19.92	R. & G. H.	8980	301.1	Chester
J. R. Humphery	Slippery Rock, Pa.	9.50	R. J.	5259	301.1	Mercer
Lee Lewis	Fairview, Pa.	12.58	R. & G. H.	8740	301.0	Erie
Levi G. Schultz Estate	Palm, Pa.	17.83	R. & G. H.	8708	301.0	Montgomery
J. L. Wood & Sons	Red Hill, Pa.	19.08	R. & G. H.	8855	300.9	Montgomery
John Parkes Sr.	Bridgeville, Pa.	11.83	R. & G. H.	7899	300.9	Washington

Owner	Address	Av. no. of cows	Breed	Lbs. milk	Lbs. B'fat	County
G. G. Wilson	Mifflin, Pa.	8.83	R. & G. J. H. & J.	6033	300.9	Juniata
J. C. McCandless	Euclid, Pa.	26.25	R. & G. J. H. & J.	6054	300.8	Butler
Stanley Ruckle	Bloomsburg, Pa.	14.42	R. & G. G.	6565	300.6	Columbia
Porter Farms	Phoenixville, Pa.	33.17	R. & G. G.	8144	300.5	Chester
Joseph Canby	Hulmeville, Pa.	22.50	P. & G. H.	9210	300.1	Bucks
Frank Murphy	New Albany, Pa.	15.00	R. & G. H. -G. G.	8764	300.0	Sullivan
Isaac M. Myers	Doylestown, Pa.	9.92	P. & G. H.	8553	300.0	Bucks
R. N. Cullough	Belleville, Pa.	17.33	R. & G. H.	8292	300.0	Mifflin
R. B. Hall	Ellisburg, Pa.	8.83	R. & G. H. -G. J.	8175	300.0	Potter
A. N. Seeley	Nescopeck, Pa.	8.67	R. & G. G.	6161	300.0	Columbia

DAIRY PRODUCTS EXHIBIT

CLASS I-MILK

AWARDS

A--RAW MARKET MILK (From Tuberculosis-free Cows)

Exhibitor	Address	County	Place	Amount
Lardner Howell	Whitford	Chester	1	\$14.00
Chester H. Pawnaall	Nottingham	Chester	2	12.00
Allen R. Eshelman	Everett	Bedford	3	10.00
Edward D. Hall	West Grove	Chester	4	8.00
James Speirs	Downingtown	Chester	5	6.00
Chester H. Cullen	West Grove	Chester		
Walter Smedley	Media	Delaware		
Arthur E. Strongren	Chester Heights	Delaware		
Swan E. Franceen	Johnsonburg	Elk		
E. J. Grifinger	St. Marys	Elk		
Jennie Mountain				
Bert Wertz	Hollidaysburg	Blair		
R. I. Tussey	Hollidaysburg	Blair		
W. S. Torbert	Newtown	Bucks		
Brandywine J. Farm	Pocopson	Chester		
H. H. Walten	New Hope	Bucks		
Eugene Etter	LeMasters	Lancaster		
H. W. Small & Son	Chambersburg	Franklin		
J. H. Snyder	Arona	Westmoreland		
William H. Lloyd	Downingtown	Chester		
D. E. Witherspoon	Chambersburg	Franklin		
Albert S. Deysher	Reading	Berks		
Jes. I. Smith	New Hope	Bucks		
J. M. Risinger	Homer City	Indiana		
H. K. Martin	Goodville	Lancaster		
E. Maule & Co.	West Grove	Chester		
Thomas & Howell	Whitford	Chester		
C. E. Martin	Waynesboro	Franklin		

Exhibitor	Address	County	Place	Amount
Mrs. Mary Folwell	Landenburg	Chester		
J. Howard Cliff	Ivyland	Bucks		
J. P. Thomas	Hollidaysburg	Blair		
Harvey E. Gummo	Hollidaysburg	Blair		
Ira M. Eby	Lemon Place	Lancaster		
Sam Eby	Gordonville	Clarion		
A. Larson	Ridgway	Elk		
Longwood Farms	Kennett Square	Chester		
Robt. E. Atkinson	Wrightstown	Bucks		
Thomas Hasfield	Downtingtown	Chester		
W. S. Sheehan	Kennett Square	Chester		
Gloucester Farms	Wyebrook	Chester		
W. W. Hurley	New Hope	Bucks		
Wentworth Farms	Rosemont	Montgomery		
N. Rathget	Greensburg	Westmoreland		
M. T. Phillips	Pomeroy	Chester		
E. I. Radcliff	Lakasha	Bucks		
Wikoff Smith	Whitford	Chester		
Mayes & Confer	Howard	Centre		
Ezra Miller	Newtown	Bucks		
Brookmead Farms	Devon	Chester		
Brandywine Modern Farm	West Chester	Chester		
Richard L. Fox	Downtingtown	Chester		
Harlan S. Gitchell	Lancaster	Lancaster		
Leroy Harvey	West Chester	Chester		
G. E. Frommeyer & Sons	Chambersburg	Franklin		
Edward Kinsey	New Hope	Bucks		
N. K. Beuch	Parkesburg	Chester		
R. F. Glenn	Bellefonte	Centre		
J. Smith	Wycombe	Bucks		
Frederick Taylor	Pulaski	Luzerne		
Blackburn Farmers	Sewickley	Allegheny		
Jos. P. Lenze	St. Marys	Elk		
E. M. Ashley	Mill Hall	Clinton		
H. F. Dayne	Whitford	Chester		

Exhibitor	Address	County	Place	Amount
Geo. Thomas	Whitford, R. D. 3	Chester		
W. N. Andrews	New Centerville	Chester		
W. N. Anderson	Everett	Bedford		
J. S. Hershberger	Catasauqua	Lehigh		
Willow Brook Farms	Kane	McKean		
Kane Coop. Dairy	Embreeville	Chester		
Hayes G. Taylor	Palm	Montgomery		
Mrs. H. B. Pielan	Peach Bottom	Lancaster		
Ross C. Urich	Cochranville	Chester		
Ramsey & Reale	Oxford	Chester		
John Pugh	Mechansville	Bucks		
Harry Vassey	Lyndall	Chester		
Geo. North	Douglasville	Berks		
H. M. Sienbach				
CLASS B—A-Raw Market Milk.				
Chester M. Long	Ivyland	Bucks	1	\$10.00
Howard Reburn	Oxford	Chester	2	9.00
Amos Bryan	Perkasie	Bucks	2 & 3	9.00
W. I. Reeves	West Chester	Chester	4	6.00
E. L. Moore & Son	West Grove	Chester	5	4.00
R. J. Weidner	Williamsburg	Blair		
Harry W. Parks	Williamsburg	Blair		
Del. Co. Home	Lima	Delaware		
Jacob R. Hoover	Gap	Lancaster		
E. A. Campbell	Pennsburg	Montgomery		
Wayne W. Hefner	McConnellstown	Huntingdon		
Daniel R. Hendricks	Solesburg	Bucks		
Gideon K. Fisher	Honey Brook	Chester		
J. E. Tomlinson	Woodside	Bucks		
J. E. Hostetter	Gap	Lancaster		
Hill Farm	Coatesville	Chester		
Lewis S. Webster	Lahaska	Bucks		
Isaac Girvin	Gordonville	Lancaster		

Amount

Place

County

Exhibitor	Kennett Square	Chester
Longwood Farms	Coatesville	Chester
Ira Copeland	Gordonville	Lancaster
Ross K. Rauck	Waynesboro	Franklin
Ira Shank	Oxford	Chester
James D. Bunting	Oxford	Chester
Kennedy Bros.	Waynesboro	Franklin
E. J. Hess	Yardley	Bucks
Malcolm Franklin	Williamsburg	Blair
E. Oscar Fouse	Downingtown	Chester
Abram L. Dolby	Chatham	Chester
Wm. P. Moore & Son	West Chester	Chester
A. O. Frye	Woodside	Bucks
John E. Thomelson	Oxford	Chester
B. E. Osborne	Downingtown	Chester
Oswald Piel	Embreeville	Chester
Taylor Bros.	Whitford	Chester
Bickling & Martin	Censelman	Chester
D. C. Pyle	Collegeville	Montgomery
Isaac Kligerman	Churchville	Bucks
Harry A. Sheetz	Dry Run	Franklin
J. Harry Hazlett	Newtown	Bucks
Robert Kenderine	Glen Moore	Chester
C. R. Henderson	Gordonville	Lancaster
Myer Hess	Bedford	Bedford
John T. Shaffer	Bedford	Bedford
Henry H. Shaffer	Bedford	Bedford
C. B. Triplett	Bedford	Bedford

CLASS C Certified Milk.

Lenkerbrook Dairy	Harrisburg
International Correspon. School	Scranton
London Hill Farm	So. Montrose
Jos. Heacock Co.	Woodside

1	\$14.00
2	12.00
3	10.00
4	8.00

Dauphin
Lackawanna
Susquehanna
Bucks

CLASS D Pasteurized Milk.

Woodlawn Farms
Geo. V. Greenawalt
Kane Dairy Co.
Indiana Coop. Dairy
Abbotts Alderney
Supplee-Wills-Jones

Scranton
Carlisle
Kane
Indiana
Philadelphia
Philadelphia

1	\$12.00
2	10.00
3	8.00
4	6.00
5	4.00

Lackawanna
Cumberland
McKean
Indiana
Philadelphia
Philadelphia

CLASS A Farm Butter.

F. J. Deiter
Willow Brook
Ralph Hosler
G. F. Thompson
Harlan Gatchall
J. B. Card
B. Harris
W. H. Bunton
F. B. Smith
Clover Leaf Farm
Merton Farm
Carl F. Smith
Geo. Peter
Mrs. Alex Shellmatter
J. M. Boyer
Hood Farms
John E. May
Mrs. R. H. Durborrow
G. Allen May
W. P. McCrea

Bradford, R. D. 1
Catasauqua
Berwick
Devon
Peach Bottom
Troy
Ohioyle
Parkesburg
Dover, No. 4
Akersville
Newtown
Punxsutawney
Beech Creek
Ebensburg
Gratz
Saltsburg
Dover
Gettysburg
Dover
Blairsville

1	\$10.00
2	7.00
3	5.00
4	3.00

McKean
Lehigh
Columbia
Chester
Lancaster
Bradford
Fayette
Chester
York
Fulton
Bucks
Jefferson
Clinton
Cambria
Dauphin
Indiana
York
Adams
York
Indiana

CLASS B Creamery Butter.

Hershey Creamery
Silverdale Creamery

Harrisburg
Scranton

1
2

1	\$10.00
2	7.00

Dauphin
Lackawanna

**End of
Volume**